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TEMPERATURE of SURFACE WATERS in MONTANA

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by
Fern C. Aagaard

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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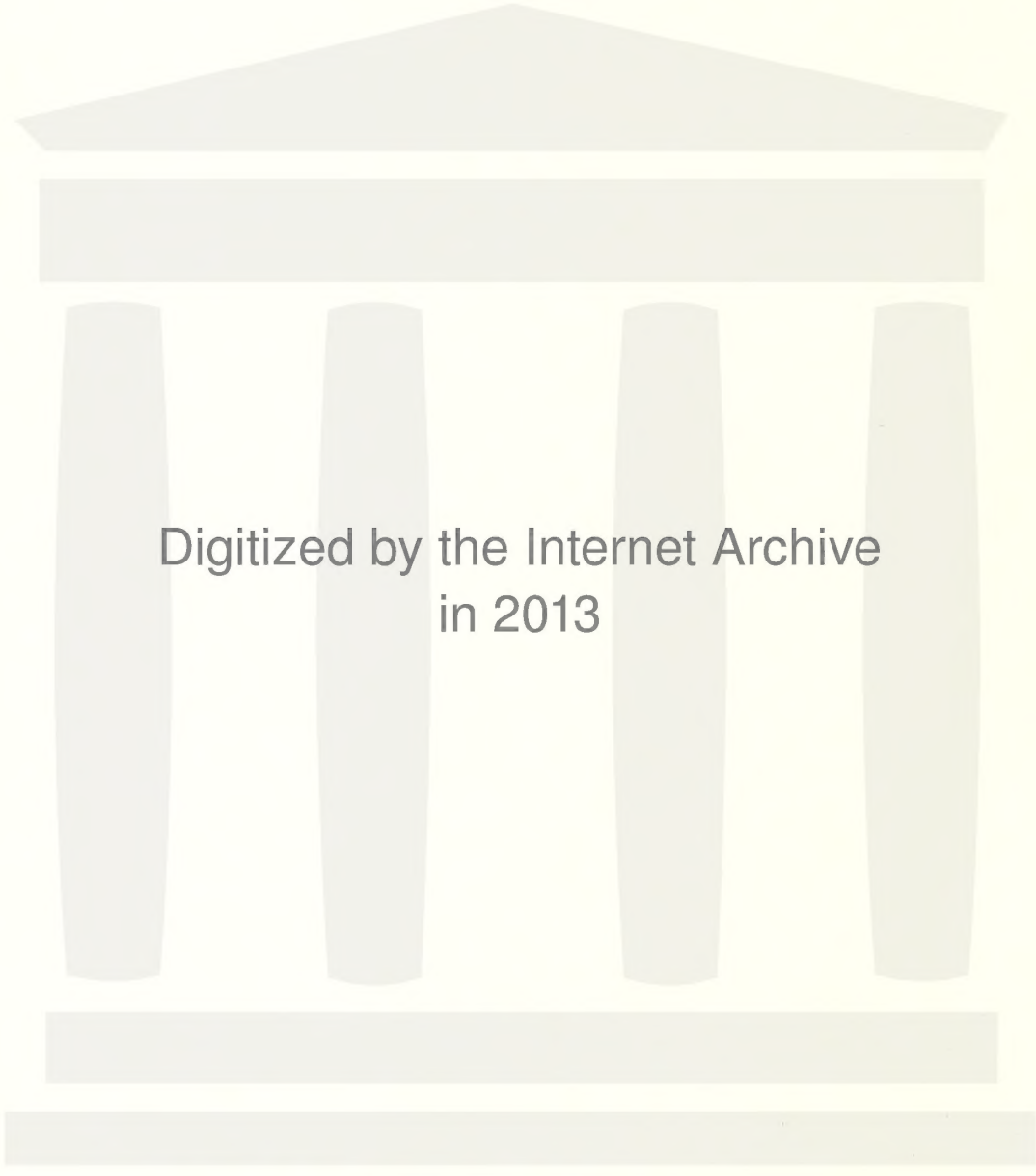
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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TEMPERATURE OF SURFACE WATERS IN MONTANA

by

Fern C. Aagaard

Prepared in cooperation with

MONTANA FISH AND GAME COMMISSION

Helena, Montana
1969

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Temperature of Surface Waters in Montana

by

Fern C. Aagaard

Introduction

This publication was compiled in response to the growing demand for data concerning surface water temperatures. The water temperatures of Montana's streams and lakes are important to all users of these waters. They are important to the sportsman and conservationist, as they are a vital factor affecting fish life. They are important to the industrial user, as water temperature affects the design of plants and the utilization of water. There is also evidence that the temperature of irrigation water can affect crop production. The physical, chemical, and biological properties of water are closely related to its temperature. Temperature is an important factor that influences sediment transport, rates of chemical reactions, and biological processes. Therefore, for many purposes, the thermal quality of water is as important a factor as the chemical quality and the sediment concentration.

Purpose and Scope

The purpose of this publication is to compile all available surface water temperature data in the State of Montana in a form usable to all interested parties. The graphs presented with each set of data will

enable the user to quickly determine the approximate range and distribution of water temperature throughout the year at each point of measurement. The tabulated data will allow a more detailed analysis of the temperatures. This publication will be a basis for evaluating the recreational and industrial potentials of streams and lakes in Montana. It will also serve as a basis for evaluating the future changes in temperature regimen caused by the works of man.

In the late 1940's, the U. S. Geological Survey began measuring water temperature at the time of stream discharge measurements and when water quality samples were collected. By 1965, spot observations of temperature had been collected at 243 locations. In 1949, continuous record by recording thermograph or by daily observations was started at three locations. Between 1949 and 1965, short periods of record of daily observations were made at 26 sites, and thermograph records were collected at 10 of the 243 sites.

Other Federal and State agencies, cities and private industries were canvassed to obtain available water temperature data. Many of these responded and stream temperature data were obtained at 56 sites. Also, vertical temperature profile data were received for 10 lakes. Thirty-seven of these sites were at or near U. S. Geological Survey streamflow or water quality stations and the data were used to supplement that obtained by the Survey.

Records of water temperatures at 272 sites on streams and lakes are included in this publication. All of the spot observations collected by the U. S. Geological Survey and most of the records collected by other agencies

have not been previously published. Most of the records are spot observations made at the time of streamflow measurements. The remainder include previously unpublished daily observations and thermograph records. Summaries of daily observations and thermograph records that have been previously published by the U. S. Geological Survey are also included in this publication. Spot observations are published only for periods of record greater than five years unless shorter records have a local significance.

Water Supply Papers, which include records of water temperature, quality of water, and streamflow data in Montana for water years 1947 to 1963 are shown in the following table.

	Quality of Surface Waters		Streamflow data		
Year	Hudson Bay and Missouri River Basins W.S.P. No.	Columbia River Basin W.S.P. No.	Hudson Bay Basin W.S.P. No.	Missouri River Basin W.S.P. No.	Columbia River Basin W.S.P. No.
1947	1102	1102	1085	1086	1092
1948	1132	1132	1115	1116	1122
1949	1162	1163	1145	1146	1152
1950	1187	1189	1175	1176	1182
1951	1198	1200	1208	1209	1216
1952	1251	1253	1238	1239	1246
1953	1291	1293	1278	1279	1286
1954	1351	1353	1338	1339	1346
1955	1401	1403	1388	1389	1396
1956	1451	1453	1438	1439	1446
1957	1521	1523	1508	1509	1516
1958	1572	1574	1558	1559	1566
1959	1643	1645	1628	1629	1636
1960	1743	1745	1708	1709	1716
1961	1883	1885			
1962	1943	1945			
1963	1949	1951			

Note.--Subsequent records may be found in the annual statewide reports, starting in 1961, Water Resources Data for Montana, Parts 1 and 2.

Acknowledgments

This compilation was made through a cooperative agreement between the U. S. Geological Survey and the Montana Fish and Game Commission. The publication was planned in cooperation with Mr. George Holton, Chief Fisheries Biologist, Montana Fish and Game Department.

The collection of water-temperature records in Montana by individuals in many Federal and State agencies, cities and private industries made this compilation possible. Some of the records were furnished by: U. S. Army, Corps of Engineers; U. S. Department of the Interior, National Park Service and Federal Water Pollution Control Agency; Montana Fish and Game Department; Montana State University, Center for Environmental Studies; City of Great Falls; City of Billings; City of Miles City; City of Livingston; The Montana Power Co.; and Hoerner-Waldorf Corporation. Their assistance and cooperation is gratefully acknowledged.

Explanation of Data

The three major drainage basins in Montana are the Hudson Bay, Missouri River, and the Columbia River basins. Numbers for water temperature measurement sites were assigned in downstream order in each of these major basins (fig. 1), according to standard practices of the U. S. Geological Survey. The site numbers are shown to the left of the site name and on the location map (fig. 1). Sites 1-14 are in the Hudson Bay basin, sites 15-204 are in the Missouri River basin, and sites 205-271 are in the Columbia River basin. The number in parentheses to the right of the site name is a permanently assigned gaging station number as used in reports of the U. S. Geological Survey since 1951. If no number appears in this space, the temperature site

is not at a U. S. Geological Survey gaging station.

Generally, data for each site includes a site description, a graph of water temperature versus time, a table of spot observations, and, if available, tables of continuous record and summaries. The graph of temperature versus time summarizes all available data. Spot observations are shown by dots. Where continuous records are available for a year or more, the graph is shaded. If continuous records are available only on a seasonal basis, lines connect the monthly extremes. Where a long-term record of once-daily observations is available, lines connect the monthly extremes. For sites where continuous records have not been previously published, daily observations of maximums and minimums are tabulated and monthly summaries are shown. At sites where continuous record has been previously published, monthly maximum and minimums are tabulated and summaries for period of record are shown.

Discrepancies found when comparing spot observations and some published record resulted in the omission of the following records from this publication.

Site No.	Station No.	Station Name	Period of Record Omitted
98	6-1080	Teton River near Dutton	August 1954 to September 1957
--	6-2043	Butcher Creek near Absarokee	5-27-60 to 8-31-62
170		North Fork Bluewater Creek near Bridger	4- 9-62 to 7-12-65
--	6-2078	Bluewater Creek near Bridger	5-16-62 to 12-31-65
171		Bluewater Creek at Sanford Ranch, near Bridger	4- 5-62 to 7-13-65
172		Bluewater Creek near Fromberg	4- 5-62 to 7-13-65
173		Bluewater Creek at Fromberg	8-15-62 to 7-23-65
180	6-2145	Yellowstone River at Billings	March to September 1958

The thermometers used by the Geological Survey are graduated in 2° intervals from 30° to 120° F and are believed accurate within 1° F. Most thermographs used by the Geological Survey are attached to a water-stage recorder and the pen trace of the thermograph record registers on the strip chart. The record is probably accurate within 1° F because hand thermometer measurements are made at each visit and, when necessary, corrections are applied to the thermograph record. Thermographs used by other agencies are mostly Taylor or Ryan instruments and they are believed accurate within 1° or 2° F.

The water temperatures given in the tables are in degrees Fahrenheit. These values may be converted to degrees Celsius (Centigrade) with the aid of the following table.

°F	°C	°F	°C	°F	°C	°F	°C
		51	10.5	71	21.6	91	32.7
32	0	52	11.1	72	22.2	92	33.3
33	.6	53	11.7	73	22.8	93	33.9
34	1.1	54	12.2	74	23.3	94	34.4
35	1.7	55	12.8	75	23.9	95	35.0
36	2.2	56	13.3	76	24.4	96	35.5
37	2.8	57	13.9	77	25.0	97	36.1
38	3.3	58	14.4	78	25.5	98	36.6
39	3.9	59	15.0	79	26.1	99	37.2
40	4.4	60	15.5	80	26.6	100	37.7
41	5.0	61	16.1	81	27.2		
42	5.6	62	16.6	82	27.8		
43	6.1	63	17.2	83	28.3		
44	6.7	64	17.8	84	28.9		
45	7.2	65	18.3	85	29.4		
46	7.8	66	18.9	86	30.0		
47	8.3	67	19.4	87	30.5		
48	8.9	68	20.0	88	31.1		
49	9.4	69	20.5	89	31.6		
50	10.0	70	21.1	90	32.2		

DISCUSSION

The geographical location of a stream in Montana has a pronounced effect on the water temperature. The altitude of measuring sites listed in this publication range from 1,850 ft at Yaak River near Troy to 6,970 ft at Big Hole River near Jackson. Water temperatures can also be affected by glacial melt, flow from springs, releases from reservoirs, irrigation return flows, channel orientation, and forest cover adjacent to the stream channel. In the mountainous areas east of the Continental Divide, maximum water temperatures for the period of record seldom reached 80° F, while the maximum known water temperatures of most prairie streams in eastern Montana exceeded 80° F during the period of record. The larger streams might exceed 80° F only once or twice in 15 years of spot temperature observations while the small ones might exceed this temperature for short periods during most years. Water temperatures of streams west of the Continental Divide are much cooler during the summer months than those east of the Divide. The maximum stream temperature observed west of the Divide is 77° F on the Clark Fork below Missoula. The maximum observed temperature east of the Divide is 93° F on the Tongue River near Miles City during a period of extreme low flow and high air temperatures.

Profiles of the maximum observed water temperatures on the Missouri and Yellowstone Rivers and the Clark Fork of the Columbia River indicate the geographic influence and show the effect of storage reservoirs and tributary inflow (figs. 2, 3, and 4).

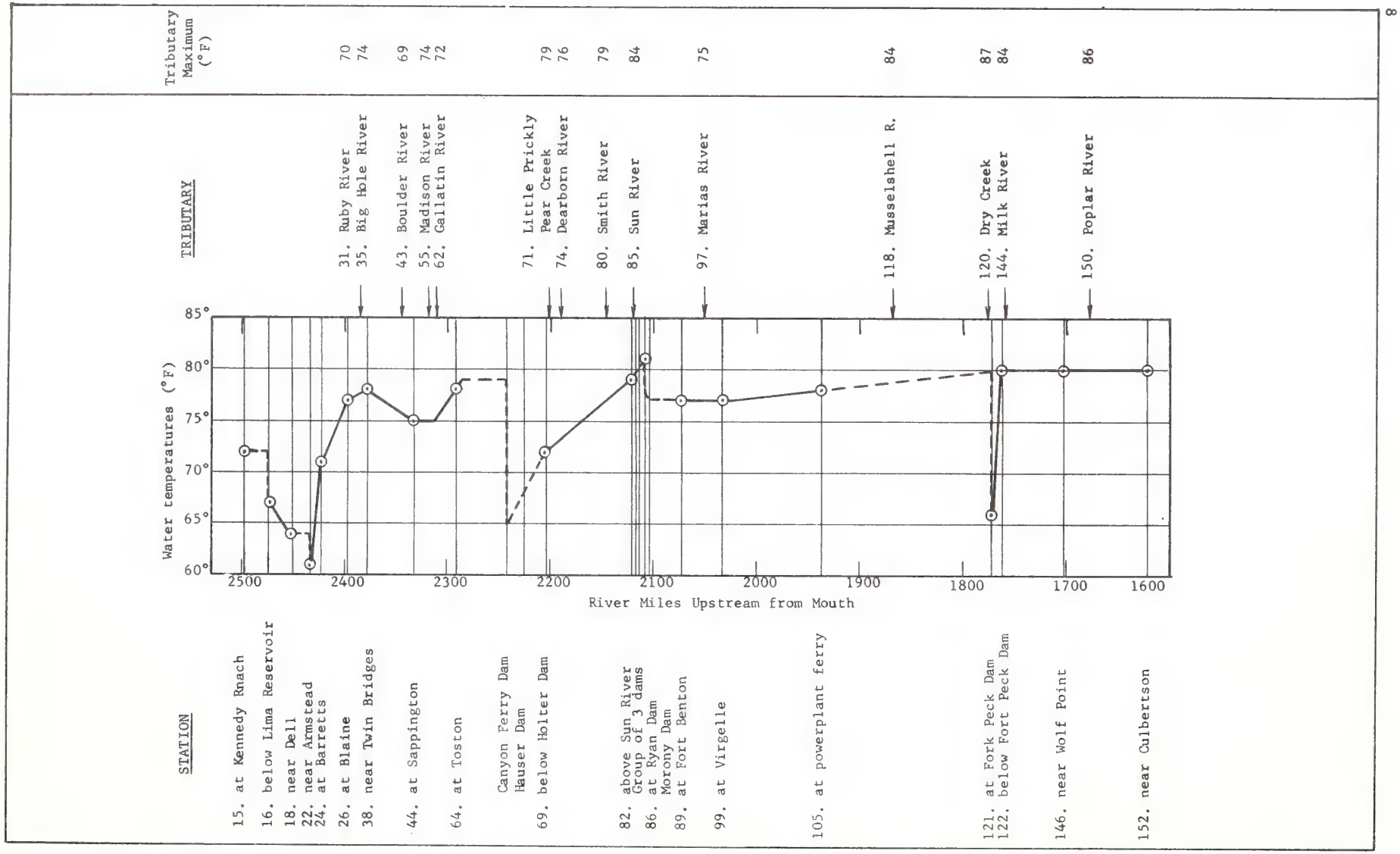


Figure 2. MAXIMUM WATER TEMPERATURE PROFILE - MISSOURI RIVER MAIN STEM

The profile shows maximum water temperatures which have been observed at points along the Missouri River. Some irregularities are probably caused by varying lengths of record at the individual measuring points. The effect of reservoirs on maximum stream temperatures are indicated by abrupt changes in the profile. Maximum water temperatures observed at the most downstream measuring point on each of the major tributary streams is indicated at the top of the illustration. Dashed lines represent estimates of stream temperature between measuring points but excluding the effect of the reservoir on water temperatures of the impounded water. Station numbers refer to those used in this report for individual measuring points and on figure 1.

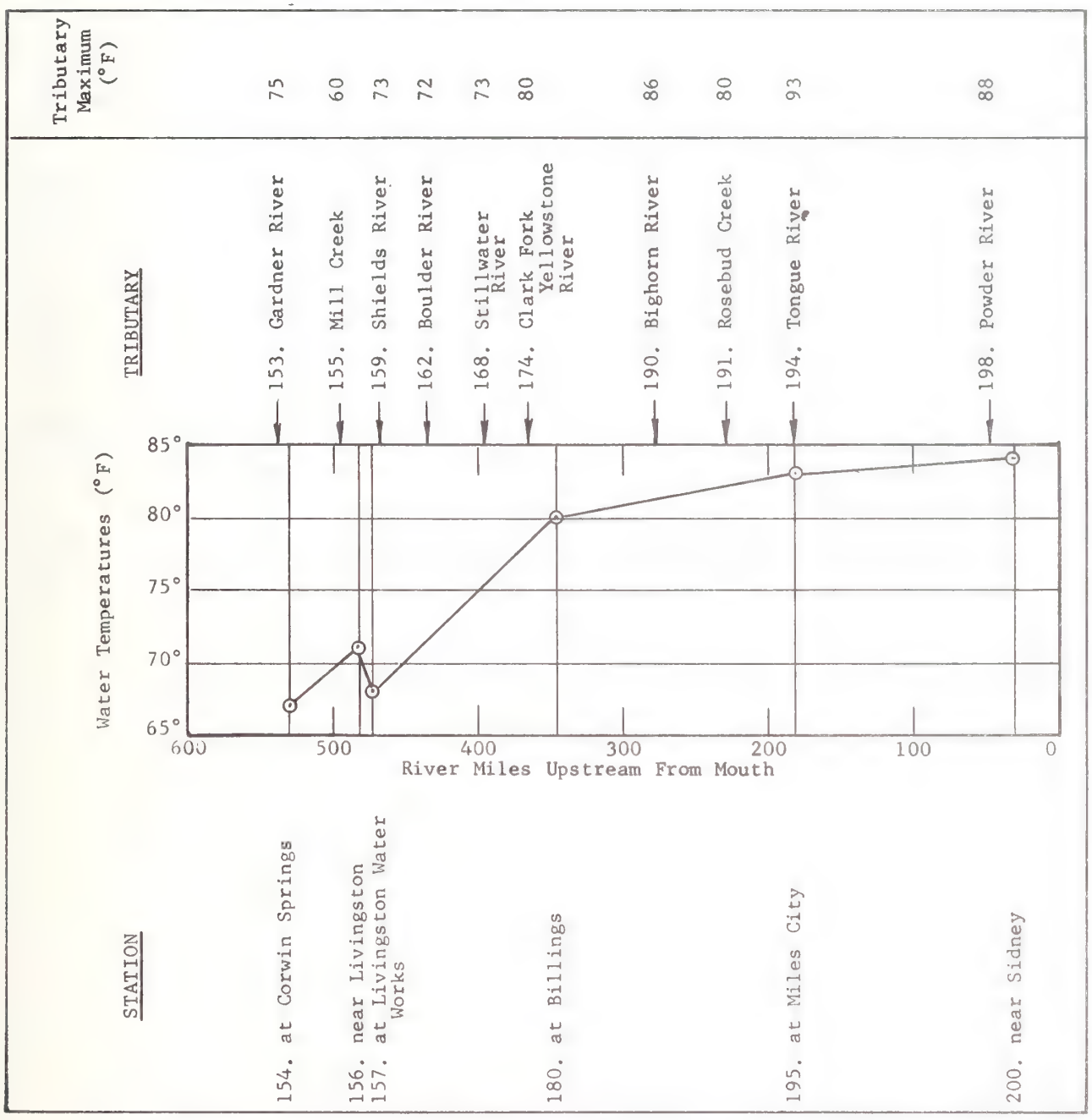


Figure 3. MAXIMUM WATER TEMPERATURE PROFILE - YELLOWSTONE RIVER

The profile of maximum water temperatures which have been observed at points along the Yellowstone River indicates rapid warming of stream temperatures between Livingston and Billings as the river flows through a wide valley at lower elevations. Maximum water temperatures observed at the most downstream measuring point on each of the major tributary streams is indicated at the top of the illustration. Station numbers refer to those used in this report for individual measuring points and on figure 1.

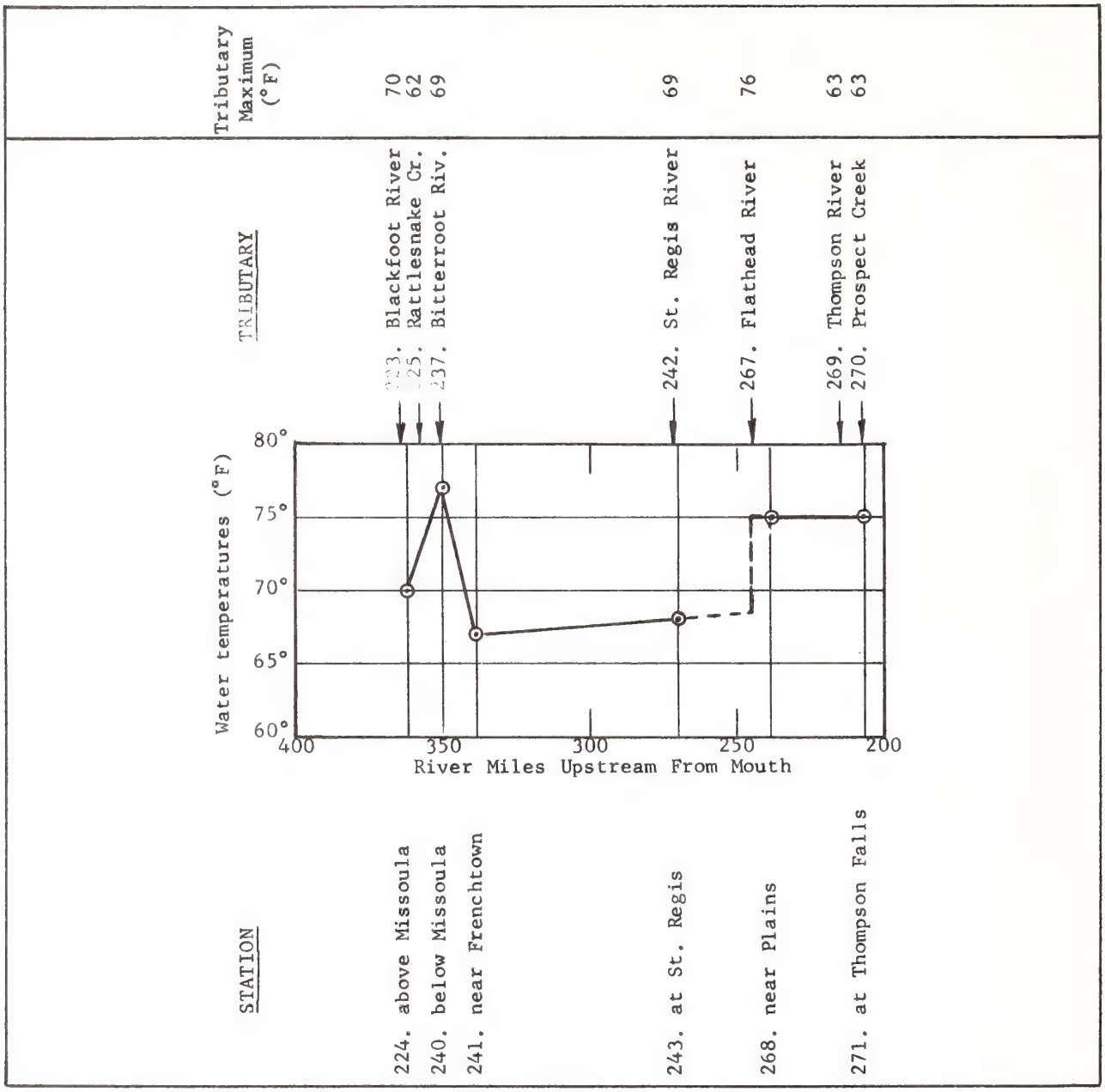


Figure 4. MAXIMUM WATER TEMPERATURE PROFILE - CLARK FORK

The profile shows maximum water temperatures which have been observed at points along the Clark Fork. Variations in the vicinity of Missoula are probably caused by different types and length of stream temperature records. The abrupt change in profile above the Plains station represents the estimated effect of the Flathead River. Maximum water temperatures observed at the most downstream measuring point on each of the major tributary streams is indicated at the top of the illustration. Dashed lines represent estimates of stream temperature between measuring points. Station numbers refer to those used in this report for individual measuring points and on figure 1.

HUDSON BAY BASIN

SASKATCHEWAN RIVER BASIN

1. Belly River at international boundary (5-0100)

Location.--At gaging station, lat 48°59'50", long 113°40'50", in NW¼ sec.2, T.37 N., R.16 W. (unsurveyed), on right bank 200 ft upstream from international boundary, 11 miles southeast of Waterton Park, Alberta, and 15 miles northwest of Babb, Mont. Altitude of gage is 4,500 ft (from topographic map).

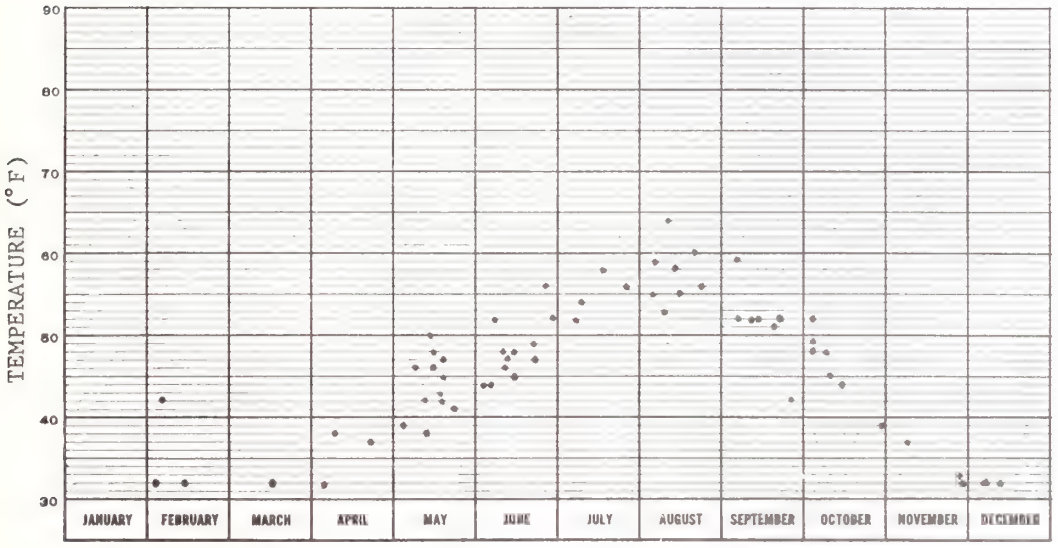
Drainage area.--74.8 sq mi.

Water temperature records available.--62 spot observations made at time of discharge measurements during period May 1949 to October 1964 (no winter records after 1957).

Extremes.--Discharge 1947-64: Maximum, about 12,000 cfs June 8, 1964; minimum daily recorded, 12 cfs Feb. 12, 13, 1949.

Water temperatures 1949-64: Maximum observed, 64°F Aug. 12, 1958; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-64

1. Belly River at international boundary (5-0100)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			18-50	1530	32	16-51	1650	32	12-52	1110	38	2-49	1400	39	7-49	2000	52
			9-52	1600	42				7-54	1400	32	6-51	1530	46	30-50	1330	52
			7-53	1130	32				25-57	1240	37	8-53	1610	38	9-51	1100	46
												23-54	1720	41	22-52	1230	49
												15-56	1635	46	15-54	1830	45
												18-56	1800	43	2-55	1130	44
												16-58	1800	47	12-57	1755	47
												17-60	1655	42	27-61	1400	56
												17-62	1835	45	15-62	1330	48
												14-63	1500	50	13-63	1840	48
												12-64	1130	42	4-64	1135	44
															19-64	1230	47
July			August			September			October			November			December		
10-49	1030	54	11-50	1100	53	8-49	1800	59	31-50	1430	39	28-51	1125	33	12-50	1745	32
7-55	1615	52	4-51	0930	55	21-50	1330	52	3-51	1705	48	6-52	1450	37	5-53	0945	32
29-56	1400	56	4-54	1700	59	5-52	1240	52	14-53	0915	44	29-56	1100	32	5-54	1015	32
17-64	1610	58	28-57	1835	56	29-55	1000	42	8-54	1305	45						
			12-58	1530	64	25-56	1445	51	2-62	1500	52						
			17-62	0930	55	15-60	1645	52	2-63	1200	49						
			15-63	1150	58	14-61	1330	52	6-64	1730	48						
			21-64	1510	60												

2. North Fork Belly River at international boundary (5-0105)

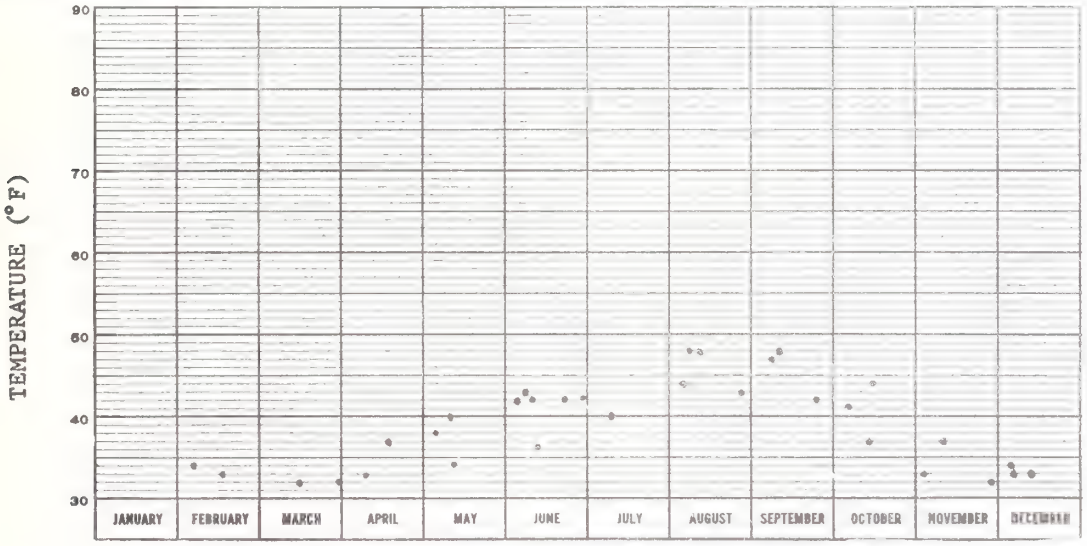
Location.--At gaging station, lat 48°59'20", long 113°45'50", in S½ sec.2, T.37 N., R.17 W. (unsurveyed), on left bank three-quarters of a mile south of international boundary, 5½ miles upstream from mouth, 8 miles southeast of Waterton Park, Alberta, and 17½ miles northwest of Babb, Mont. Altitude of gage is 5,100 ft (from topographic map).

Drainage area.--10.1 sq mi.

Water temperature records available.--32 spot observations made at time of discharge measurements during period May 1949 to September 1955 (no winter records after 1952).

Extremes.--Discharge 1947-55: Maximum, 416 cfs June 3, 1953; minimum recorded, 0.5 cfs Apr. 3, 1948, Feb. 11-13, 1949.
Water temperatures 1949-55: Maximum observed, 48°F Aug. 11, 1950, Aug. 7, 1951, Sept. 9, 1949; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-55

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			19-50	1300	33	16-51	1155	32	11-52	1100	37	3-49	1230	38	7-49	1500	43
			10-52	1330	34	30-55	1200	32	7-54	1020	33	7-51	1300	40	30-50	1330	42
												9-53	1140	34	11-51	1120	42
															21-52	1500	42
															16-53	1140	36
															3-55	1245	42
July			August			September			October			November			December		
9-55	1215	40	11-50	1700	48	9-49	1300	48	5-51	1230	41	2-50	1245	33	13-50	1140	33
			29-50	1200	43	7-52	1440	47	14-53	1445	44	29-51	1330	32	4-52	1210	33
			7-51	1335	48	27-55	1340	42	12-54	1130	37	9-52	1225	37	3-54	1330	34
			4-54	1200	44												

3. Waterton River near international boundary (5-0115)

Location.--At gaging station, lat 48°57'20", long 113°54'00", in NW¼ sec.23, T.37 N., R.18 W. (unsurveyed), on right bank 100 ft downstream from Olson Creek, 3 miles south of international boundary, and 7 miles south of Waterton Park, Alberta. Altitude of gage is 4,200 ft (from topographic map).

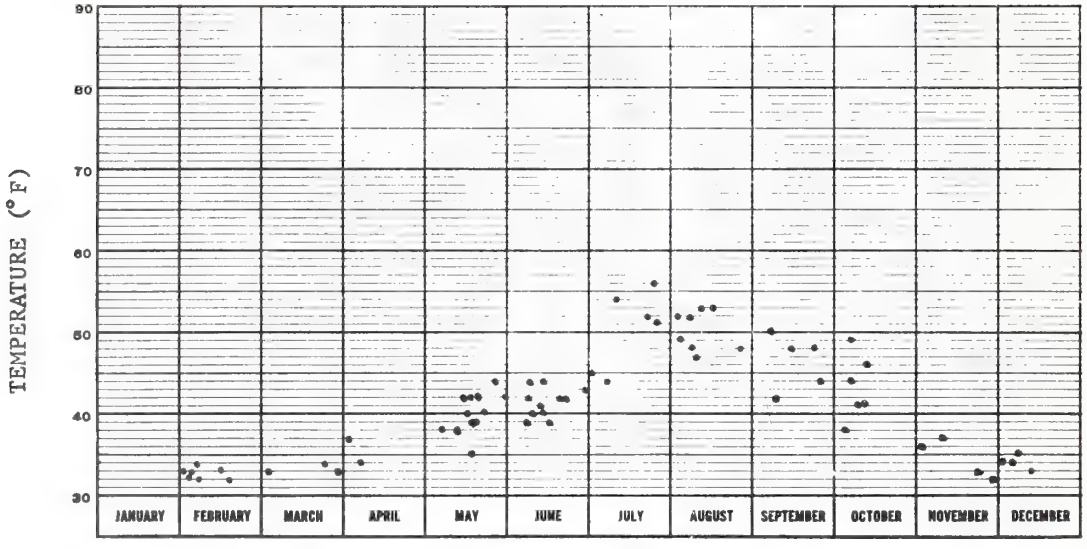
Drainage area.--61.0 sq mi.

Water temperature records available.--68 spot observations made at time of discharge measurements during period April 1949 to October 1964 (no winter records after 1957).

Extremes.--Discharge 1947-64: Maximum, 12,400 cfs June 8, 1964; minimum recorded, 8.7 cfs Dec. 24, 1952.

Water temperatures 1949-64: Maximum observed, 56°F July 28, 1956; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-64

3. Waterton River near international boundary (5-0115)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			21-50	1100	32	2-53	1850	33	1-49	1330	37	4-49	1300	38	8-49	1600	44
			7-51	1715	32	29-55	1510	33	10-52	1110	34	20-50	1700	39	10-51	1245	44
			5-52	1600	33	24-56	1830	34				22-54	1730	40	24-52	1525	42
			6-53	1040	34							25-55	1425	44	17-54	1545	39
			1-54	1230	33							18-56	1415	40	11-57	1510	42
			3-55	1730	32							30-56	1120	42	15-60	1000	40
			15-57	1530	33							17-58	1340	42	14-62	1100	41
												18-60	1240	35	13-63	1125	40
												17-61	1000	39	5-64	1130	39
												17-62	1300	42	20-64	1410	42
												15-63	1330	42	30-64	1150	43
												13-64	1000	38			
July			August			September			October			November			December		
11-49	1600	54	10-50	1530	52	10-49	1100	43	4-51	1540	44	1-50	1520	36	14-50	1500	33
1-50	1900	45	5-51	1230	52	23-50	1230	48	13-53	1350	46	30-51	1530	32	3-53	1500	34
25-50	1230	52	3-54	1305	49	6-52	1245	50	7-54	1230	41	8-52	1355	37	4-52	1320	35
8-55	1500	44	28-57	1230	48	28-55	1325	44	2-62	0920	38	28-56	1100	33	1-55	1210	34
28-56	1640	56	13-58	1100	47	15-60	1135	48	3-63	1130	49						
29-64	1300	52	12-59	1415	48				7-64	1055	41						
			16-62	1130	53												
			14-63	1025	53												

4. Street Creek at international boundary (5-0120)

Location.--At gaging station, lat 48°59'20", long 113°52'40", in NE¼ sec.11, T.37 N., R.18 W. (unsurveyed), on left bank half a mile upstream from mouth, three-quarters of a mile south of international boundary, and 5 miles south of Waterton Park, Alberta. Altitude of gage is 4,400 ft (from topographic map).

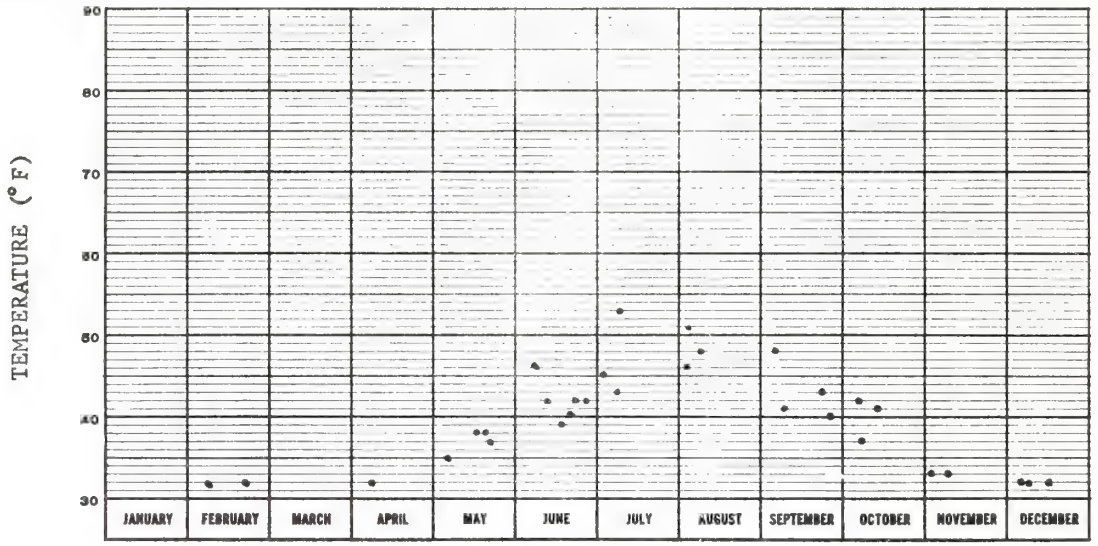
Drainage area.--6.0 sq mi, approximately.

Water temperature records available.--31 spot observations made at time of discharge measurements during period May 1949 to October 1955 (no winter records after 1952).

Extremes.--Discharge 1947-55: Maximum, 437 cfs June 3, 1953; minimum daily, 0.2 cfs Nov. 25-27, 1952, but may have been less during periods of ice effect or no gage height record.

Water temperatures 1949-55: Maximum observed, 53°F July 11, 1949; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-55

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			21-50	1630	32				10-52	1330	32	5-49	1230	35	8-49	1800	46
			8-51	1230	32							20-50	1400	37	10-51	1020	42
												22-54	1430	38	24-52	1335	42
												25-55	1130	38	23-53	1215	40
															27-53	1500	42
															17-54	1310	39
July			August			September			October			November			December		
11-49	1230	53	10-50	1200	48	10-49	1500	41	4-51	1245	42	1-50	1215	33	14-50	1300	32
1-50	1630	45	5-51	1820	51	23-50	1430	43	13-53	1600	41	8-52	1130	33	3-53	1120	32
8-55	1230	43	3-54	1030	46	6-52	1540	48	7-54	1030	37				4-54	1110	32
						28-55	1045	40									

5. Boundary Creek at international boundary (5-0125)

Location.--At gaging station, lat 48°59'50", long 113°54'20", in NE¼ sec.3, T.37 N., R.18 W. (unsurveyed), on right bank a quarter of a mile upstream from mouth, a quarter of a mile south of international boundary, and 4 miles south of Waterton Park, Alberta. Altitude of gage is 4,300 ft (from topographic map). Gage destroyed by flood of June 8, 1964.

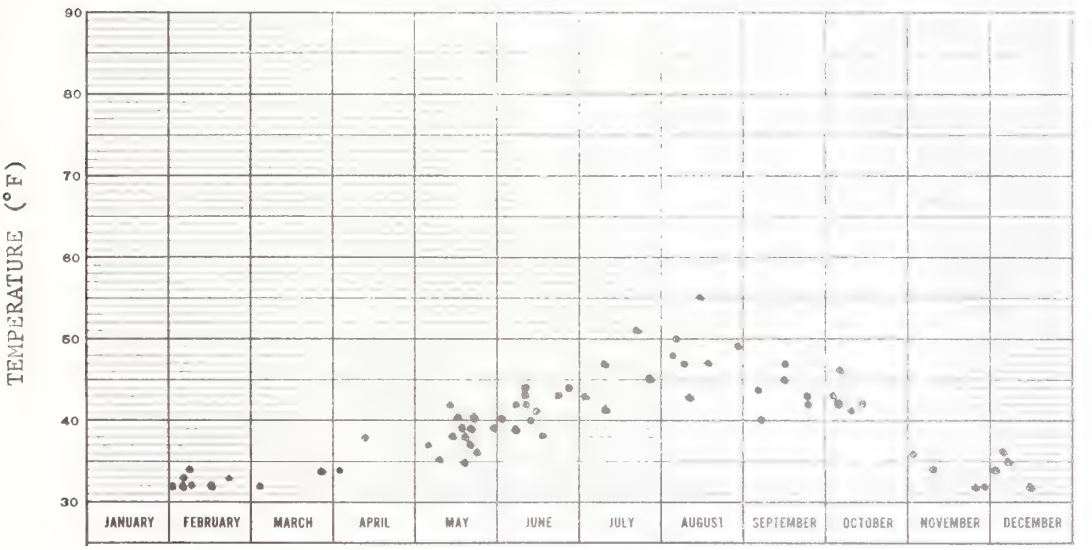
Drainage area.--21.0 sq mi.

Water temperature records available.--66 spot observations made at time of discharge measurements during period April 1949 to June 1964 (no winter records after 1957).

Extremes.--Discharge 1947-64: Maximum, 5,930 cfs, June 8, 1964; minimum recorded, 4.0 cfs Mar. 15, 1952, but may have been less during periods of ice effect or no gage height record.

Water temperatures 1949-64: Maximum observed, 55°F Aug. 14, 1963; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-64

5. Boundary Creek at international boundary (5-0125)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			20-50	1600	33	2-53	1510	32	1-49	1100	34	4-49	1330	37	8-49	1200	42
			7-51	1300	32	24-56	1430	34	10-52	1430	38	20-50	1130	36	10-51	1610	44
			5-52	1240	33							7-53	1900	35	24-52	1120	43
			6-53	1300	34							22-54	1950	37	17-54	1105	38
			1-54	1500	32							25-55	1620	40	11-57	1100	43
			3-55	1350	32							18-56	1030	39	15-60	1430	41
			15-57	1210	32							30-56	1320	39	1-62	1000	40
												17-58	1100	39	14-62	1400	40
												14-59	1440	42	13-63	1405	43
												18-60	1515	35	28-63	1010	44
												17-62	1015	38	5-64	1500	39
												15-63	1000	40			
												13-64	1300	38			
July			August			September			October			November			December		
11-49	1100	47	9-50	1800	47	10-49	1700	40	4-51	1030	42	1-50	1800	36	14-50	1100	32
1-50	1330	43	5-51	0945	50	23-50	1030	43	13-53	1145	42	30-51	1200	32	3-53	1645	36
25-50	0945	51	3-54	1530	48	6-52	1030	44	7-54	1440	41	8-52	0945	34	4-54	1500	35
8-55	1040	41	28-57	1435	49	28-55	1540	42	2-62	1135	43	28-56	1210	32	1-55	1545	34
28-56	1200	45	12-59	1145	43	15-60	1415	47	3-63	0930	46						
			16-62	0930	47	15-61	1130	45									
			14-63	1310	55												

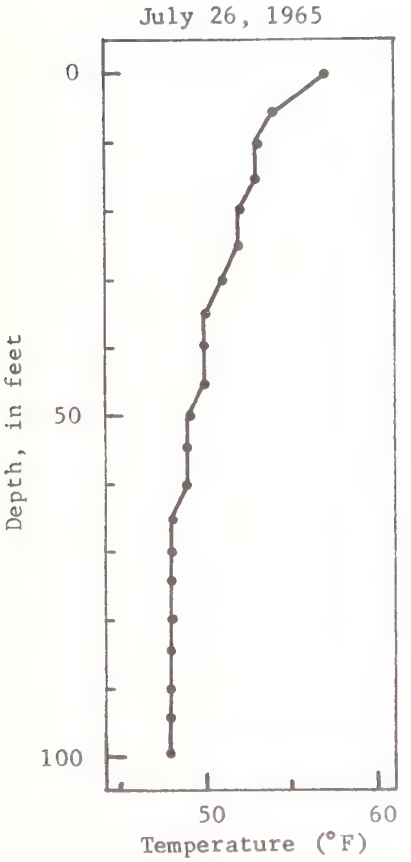
6. St. Mary Lake at Rising Sun Camp, near St. Mary, Mont. (5-0135)

Location.--Lat 48°41', long 113°31', in SE¼ sec.23, T.34 N., R.15 W., (unsurveyed), 5 miles southwest of former gage site at St. Mary Chalet, and 6 miles southwest of St. Mary. Altitude of lake is 4,473 ft (from topographic map).

Drainage area.--130 sq mi.

Water temperature records available.--One vertical profile taken on July 26, 1965.

Cooperation.--Records furnished by the National Park Service, Glacier National Park.



Depth, in feet	Temp. in Degrees F
Surface	57
5	54
10	53
15	53
20	52
25	52
30	51
35	50
40	50
45	50
50	49
55	49
60	49
65	48
70	48
75	48
80	48
85	48
90	48
95	48
100	48

7. Grinnell Creek at Grinnell Glacier, near Many Glacier, Mont. (5-0139)

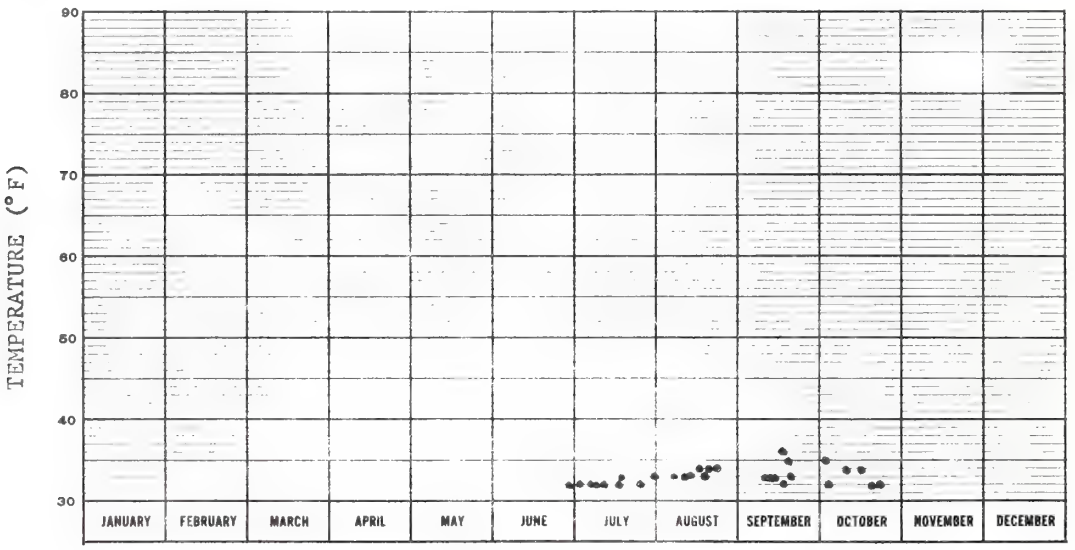
Location.--At gaging station, lat 48°45'30", long 113°43'30", in SW¼ sec.25, T.35 N., R.17 W. (unsurveyed), on left bank a quarter of a mile downstream from Grinnell Glacier, a quarter of a mile upstream from Grinnell Falls, 4 miles southwest of Many Glacier, and 15 miles southwest of Babb. Datum of gage is 6,322 ft above mean sea level (plane-table benchmark).

Drainage area.--1.1 sq mi, approximately.

Water temperature records available.--29 spot observations made at time of discharge measurements during period September 1958 to October 1965 (no winter records).

Extremes.--Discharge 1959-65: Maximum recorded, 100 cfs Aug. 3, 1960; no flow at times; probably no flow during most of each winter.
Water temperatures 1958-65: Maximum observed, 36°F Sept. 16, 1964; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures affected by Grinnell Glacier a quarter of a mile upstream.



Spot observations of water temperatures, 1958-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
															30-65	1405	32
July			August			September			October			November			December		
16-59	1525	33	5-59	1105	33	14-58	1420	33	20-60	1550	32						
12-60	1345	32	11-60	1530	33	16-59	1300	32	19-61	1555	32						
12-61	1540	32	15-61	1430	34	13-60	1505	33	3-62	1400	32						
10-62	1440	32	16-62	1710	33	19-61	1440	33	15-63	1245	34						
2-63	1330	32	17-63	1340	34	12-62	1225	33	11-64	1200	34						
25-63	1555	32	20-64	1420	34	18-63	1255	35	2-65	1550	35						
16-64	1250	32	12-65	1530	33	16-64	1340	36									
30-65	1315	33															

8. Grinnell Creek near Many Glacier, Mont. (5-0140)

Location.--At gaging station, lat 48°46'20", long 113°41'50", in NE¼ sec.21, T.33 N., R.16 W. (unsurveyed), on right bank 500 ft upstream from trail crossing, 1,000 ft downstream from Grinnell Lake, a quarter of a mile upstream from mouth, 3 miles southwest of Many Glacier, and 13½ miles southwest of Babb. Altitude of gage is 5,000 ft (from topographic map).

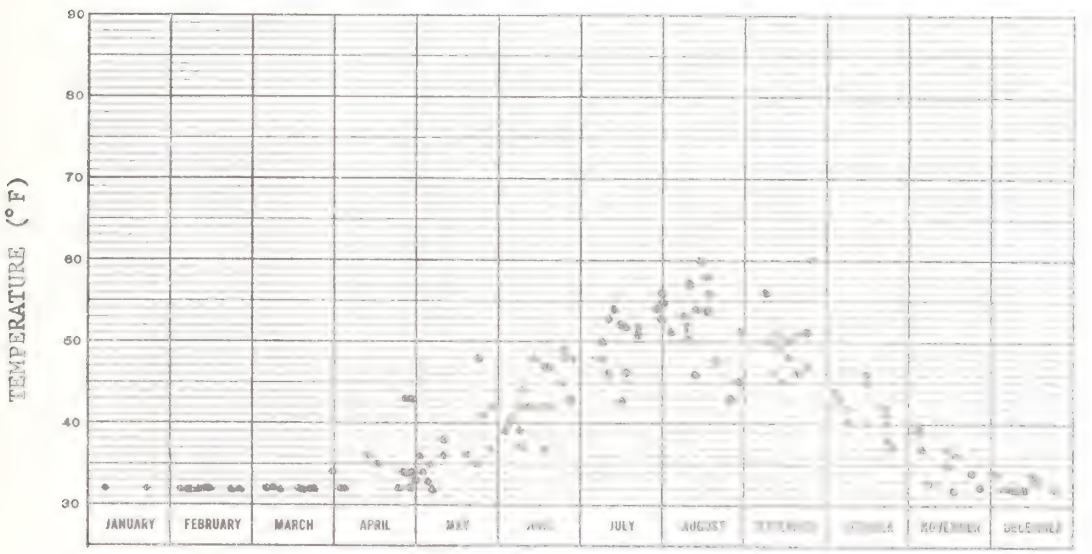
Drainage area.--3.47 sq mi.

Water temperature records available.--143 spot observations made at time of discharge measurements during period September 1949 to December 1965.

Extremes.--Discharge 1949-65: Maximum, 536 cfs June 8, 1964; minimum, probably less than 0.2 cfs at times in winter periods.

Water temperatures 1949-65: Maximum observed, 60°F Sept. 27, 1949, Aug. 15, 1961; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures affected by Grinnell Glacier and natural storage in Grinnell Lake.



Spot observations of water temperatures, 1949-65

8. Grinnell Creek near Many Glacier, Mont. (5-0140)
Water temperatures at time of discharge measurements

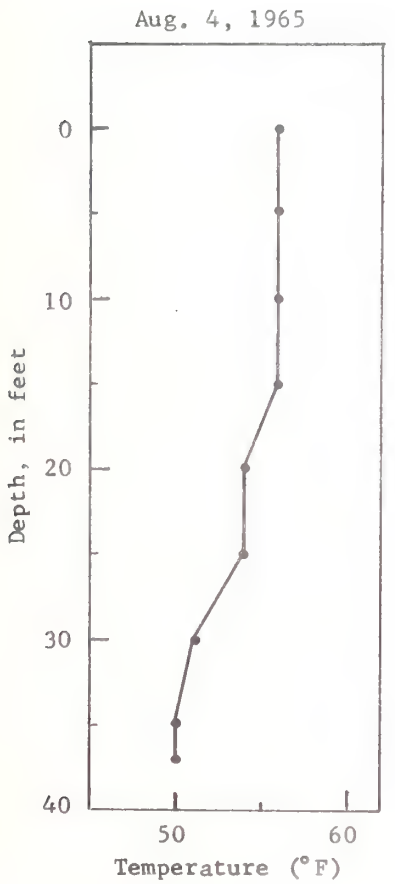
Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
19-56	1620	32	22-50	1430	32	18-51	1610	32	2-50	1130	32	4-51	1550	35	9-50	1200	37
8-59	1410	32	11-51	1750	32	4-52	1600	32	13-52	1330	36	6-52	1345	38	28-50	1200	48
			12-52	1605	32	4-53	1250	32	30-53	1250	34	6-54	1220	36	7-51	1200	42
			3-53	1520	32	18-54	1735	32	23-57	1430	32	24-54	1300	35	20-51	1400	47
			10-60	1120	32	21-56	1600	32	29-58	1500	43	5-55	1220	32	3-52	1110	40
			14-62	1235	32	5-59	1600	32	30-59	1445	33	3-56	1725	33	18-54	1200	37
			27-63	1245	32	22-61	1230	32	29-60	1350	43	29-56	1205	37	1-55	1645	39
			14-64	1400	32	22-62	1650	32	17-63	1225	35	28-57	1210	41	21-56	1045	42
			11-65	1420	32	31-65	1100	34	30-63	1820	34	27-58	1605	48	27-57	1430	49
									2-64	1415	32	20-60	1230	36	18-58	1230	47
									29-64	1520	32	2-61	1515	34	17-59	1320	42
									29-65	1530	34	1-62	1550	36	8-60	1655	44
												30-62	1245	42	28-60	1130	48
															14-61	1150	48
															12-63	1200	42
															26-63	1350	45
															7-64	1340	39
															17-64	1400	42
															3-65	1145	41
															29-65	1025	43
July			August			September			October			November			December		
8-51	1140	48	12-50	1400	57	7-49	1500	56	12-49	1330	40	15-49	1230	37	15-50	1400	34
15-52	1615	52	1-51	1130	52	27-49	1630	60	20-50	1630	40	6-51	1330	37	11-52	1500	32
23-53	1250	52	11-52	1150	54	20-50	1200	51	3-51	1140	44	27-51	1400	32	6-53	1520	32
15-54	0930	43	6-54	1020	50	8-51	1140	50	16-53	1240	46	9-52	1100	33	7-54	1230	32
12-55	1045	50	27-54	0950	43	9-52	1040	50	10-54	1145	42	3-54	1510	39	11-57	1210	32
31-56	1115	56	16-55	1610	54	14-55	1745	49	20-55	1420	42	19-55	1505	36	8-59	1150	32
29-57	1200	54	29-56	1230	45	26-56	1430	47	24-56	1155	37	27-56	1205	34	1-60	1100	34
31-58	1140	55	29-57	1125	51	26-57	1230	51	23-57	1615	38	18-58	1610	32	20-63	1325	32
15-59	1535	52	8-59	1615	53	14-58	1040	48	14-59	1620	40	17-64	1215	35	17-65	1255	33
12-60	1710	46	12-60	1020	46	16-59	1715	45	20-60	1030	41	3-65	1435	40			
13-61	1200	54	15-61	1820	60	13-60	1125	51	19-61	1305	42						
10-62	1040	53	16-62	1215	58	19-61	1105	46	3-62	1640	44						
24-63	1000	51	18-63	1130	56	12-62	1710	46	15-63	1720	45						
16-64	1730	46	19-64	1250	48	18-63	1555	50	9-64	1240	42						
30-65	1525	53				16-64	1645	50	1-65	1730	42						

9. Lake Josephine near Many Glacier, Mont.

Location.--Lat 48°47', long 113°40', in NE¼ sec.22, T.35 N., R.16 W., (unsurveyed), an eighth of a mile upstream from outlet, 1½ miles southwest of Many Glacier. Altitude of lake is 4,880 ft (from topogrpahic map).

Water temperature records available.--One vertical profile taken on Aug. 4, 1965.

Cooperation.--Records furnished by the National Park Service, Glacier National Park.



Depth, in feet	Temp. in Degrees F
Surface	56
5	56
10	56
15	56
20	54
25	54
30	51
35	50
37	50

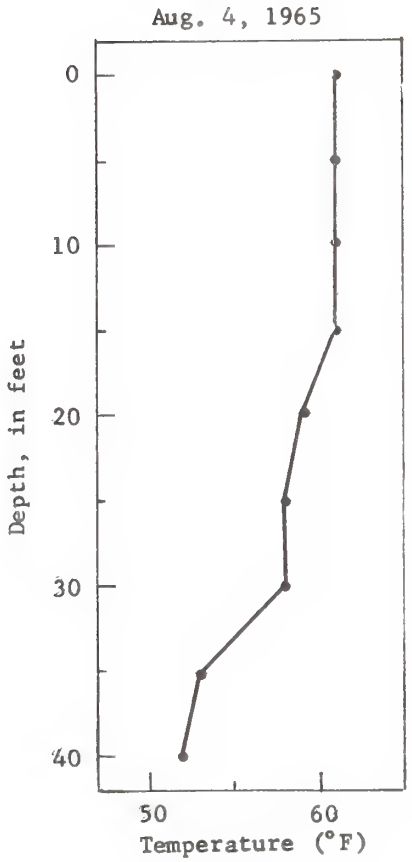
10. Swiftcurrent Lake at Many Glacier, Mont.

Location.--Lat 48°48', long 113°40', in N½ sec.14, T.35 N., R.16 W., (unsurveyed), a quarter of a mile west of Many Glacier Hotel at Many Glacier. Altitude of lake if 4,860 ft (from topographic map).

Drainage area.--31.4 sq mi.

Water temperature records available.--One vertical profile taken on Aug. 4, 1965.

Cooperation.--Records furnished by the National Park Service, Glacier National Park.



Depth, in feet	Temp. in Degrees F
Surface	61
5	61
10	61
15	61
20	59
25	58
30	58
35	53
40	52

11. Swiftcurrent Creek at Many Glacier, Mont. (5-0145)

Location.--At gaging station, lat 48°48'10", long 113°39'20", in SE¼ sec.11, T.35 N., R.16 W. (unsurveyed), on right bank 100 ft upstream from outlet of Swiftcurrent Lake at Many Glacier, Glacier National Park, and 11 miles southwest of Babb. Altitude of gage is 4,860 ft (from topographic map).

Drainage area.--31.4 sq mi.

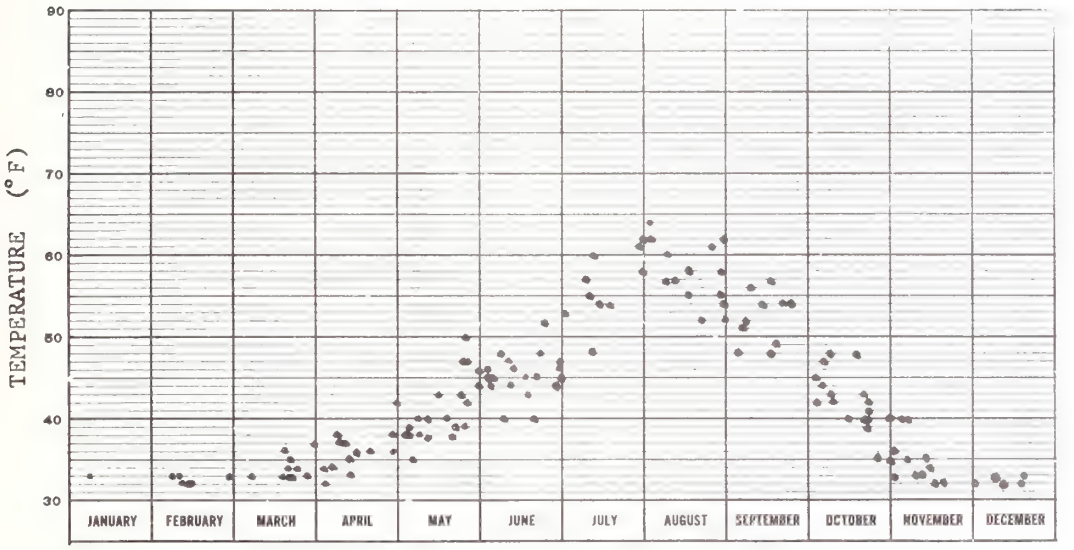
Water temperature records available.--137 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1912-65: Maximum, 6,700 cfs June 8, 1964; minimum, 8.3 cfs Mar. 2, 1964.

Water temperatures 1949-65: Maximum observed, 64°F Aug. 1, 1961; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures are taken at the measuring section about a quarter of a mile downstream from lake outlet and are affected by natural storage in Swiftcurrent Lake.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-65

11. Swiftcurrent Creek at Many Glacier, Mont. (5-0145)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
9-59	0920	33	10-60	1750	33	31-49	1530	37	2-50	1600	32	3-51	1600	39	9-50	1630	40
			14-62	1740	32	19-54	0945	34	13-52	1545	37	5-52	1730	40	18-54	1010	40
			10-63	1700	33	17-55	1300	33	14-53	1840	33	5-53	1800	38	21-56	1705	45
			27-63	1730	34	21-56	1250	34	23-57	1750	36	26-54	1430	39	14-57	1755	44
			14-64	1730	32	19-58	1715	33	30-58	1745	42	24-55	1300	39	16-59	1720	45
			12-65	1130	32	6-59	0935	33	10-59	1130	37	4-56	1030	35	30-59	1040	46
						21-61	1300	33	7-60	1300	38	19-56	1610	38	30-59	1510	47
						23-62	1120	35	29-60	1820	38	28-56	1535	42	8-60	1300	48
						20-63	1400	36	7-61	1430	34	28-57	1640	47	14-60	1700	46
						30-65	1915	33	12-62	1630	35	15-58	1930	43	26-61	1430	52
									16-63	1210	36	27-58	1210	47	13-62	1750	47
									2-64	1730	34	20-60	1635	40	26-63	1800	48
									30-64	1730	38	25-61	1700	43	30-63	1200	45
									29-65	1925	36	31-61	1600	44	2-64	1435	44
												2-62	1735	38	3-64	1330	45
												30-62	1750	46	18-64	1145	43
												2-63	1500	38	2-65	1600	46
												27-63	1700	50	3-65	1550	45
												13-64	1830	38	29-65	1430	44
												13-65	1705	40			
July			August			September			October			November			December		
8-49	1830	57	26-54	1645	52	20-50	1500	54	3-51	1615	44	1-50	1600	36	7-54	1700	33
9-51	1110	48	16-55	1935	55	7-51	1100	52	20-53	1355	43	6-51	1615	35	8-59	1620	32
12-55	1745	54	29-56	1645	55	8-52	1855	51	10-54	1610	42	9-52	1530	33	1-60	1535	32
31-58	1505	62	29-57	1450	58	10-53	1710	56	21-55	0930	42	9-53	1530	33	18-63	1645	33
28-60	1745	61	27-58	1030	61	16-55	1130	48	25-56	1610	35	18-58	1200	32	17-65	1705	32
13-61	1645	60	11-59	1630	57	26-57	1630	54	2-58	1115	45	1-61	1110	33			
9-62	1920	55	10-60	1835	60	18-61	1230	57	31-58	1100	40	7-62	1400	40			
31-63	1500	58	1-61	1430	64	17-63	1500	54	15-59	1445	40	14-62	1015	35			
1-64	1715	53	30-61	1600	62	2-64	1450	48	21-60	1025	40	20-63	1520	32			
17-64	1245	54	17-62	1910	58	17-64	1300	49	21-60	1125	41	17-64	1600	34			
			30-62	1700	54				20-61	1100	40	3-65	1050	40			
			13-64	1600	57				4-62	1250	47						
			31-65	1510	54				16-63	1655	48						
									31-63	1420	35						
									9-64	1830	43						
									3-65	1400	42						
									7-65	1245	48						
									19-65	1320	39						

12. Swiftcurrent Creek at Sherburne, Mont. (5-0160)

Location.--At gaging station, lat 48°50'00", long 113°30'30", in SW¼ sec.36, T.36 N., R.15 W. on left bank 1,000 ft downstream from outlet of Lake Sherburne Dam at Sherburne and 4½ miles southwest of Babb. Datum of gage is 4,720.81 ft above mean sea level (Bureau of Reclamation benchmark).

Drainage area.--64.3 sq mi.

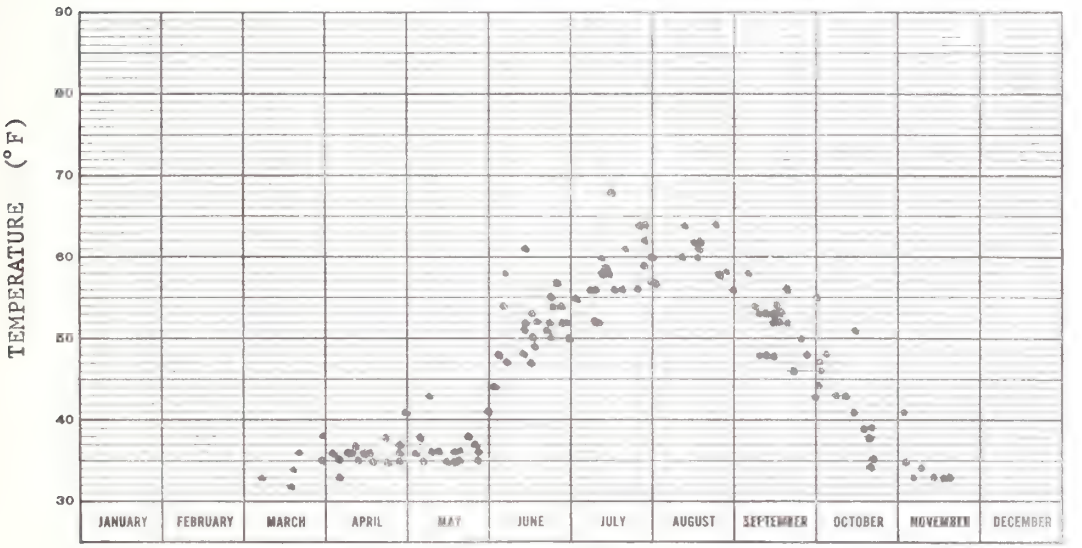
Water temperature records available.--134 spot observations made at time of discharge measurements during period May 1949 to December 1965 (no winter records).

Extremes.--Discharge 1912-64: Maximum, 2,360 cfs June 11 1964, no flow at times when gates in dam were closed.

Water temperatures 1949-65: Maximum observed, 68°F July 15, 1965; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures affected by storage in Lake Sherburne.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-65

12. Swiftcurrent Creek at Sherburne, Mont. (5-0160)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						22-56	0930	36	3-50	1200	33	4-49	1900	38	27-50	1800	50
						18-58	1900	32	13-52	1800	37	16-50	2030	35	3-52	1620	54
						6-59	1130	33	14-53	1630	35	7-52	0930	43	25-52	1045	52
						20-59	1500	34	24-57	1300	35	4-55	1715	37	26-52	1300	55
						31-64	1835	38	28-58	1915	36	23-55	1600	43	14-54	2040	48
						30-65	1655	35	10-59	1430	36	4-56	1315	35	1-55	1300	44
									28-60	1725	35	28-56	1805	44	21-56	1820	51
									6-61	1500	35	29-57	1115	50	27-57	1825	54
									18-61	1135	35	15-58	1725	52	18-58	1800	52
									25-61	1030	38	27-58	0945	55	15-59	1520	52
									12-62	1430	36	29-59	1300	46	29-59	1800	52
									18-62	1835	36	20-60	1850	42	9-60	1220	58
									17-63	1700	36	18-61	1400	51	28-60	1800	57
									3-64	1555	36	15-62	1930	46	29-60	1200	52
									28-64	1330	37	31-62	1100	52	14-61	1910	61
									30-65	1040	41	16-63	1630	50	15-63	0195	53
												14-64	1820	44	28-63	1850	54
												13-65	1400	42	6-64	1845	47
															16-64	1915	47
															18-64	1615	48
															3-65	1815	48
															14-65	1945	51
															17-65	1910	50
															29-65	1530	50
July			August			September			October			November			December		
8-49	1530	56	25-54	1510	58	28-49	0930	48	1-51	1510	47	2-50	1630	35			
27-50	1230	56	17-55	1800	60	20-50	1800	56	20-53	1610	39	5-51	1650	33			
9-51	1610	52	29-57	1815	58	7-51	1800	54	9-54	1355	43	7-52	1635	34			
8-52	1500	56	27-58	1230	64	3-52	1500	58	25-56	1500	35	13-62	1700	33			
14-52	1725	58	13-59	1555	60	16-55	1015	53	24-57	1330	34	18-64	1325	33			
24-53	1530	61	14-61	2010	64	30-55	1650	43	2-58	1245	46	2-65	1715	41			
13-55	1400	58	17-62	1730	61	25-56	1745	50	1-59	1010	44	17-65	1030	33			
11-56	1245	52	30-62	1430	56	13-58	1830	53	15-59	1735	41						
30-56	1845	60	18-63	1600	62	16-58	1640	52	20-61	1225	39						
16-58	1845	56	1-64	1115	57	14-59	1830	48	4-62	1115	48						
28-58	2000	59	1-64	1440	57	17-60	1115	54	1-63	1330	55						
17-59	1110	56	16-65	1500	62	13-61	1500	53	16-63	1435	51						
28-60	1055	62				18-61	1845	52	8-64	1750	43						
28-60	1245	64				11-62	1245	48	19-65	1720	38						
28-60	1450	64				17-63	1700	54									
13-61	1850	60				20-63	1830	52									
13-62	1140	57				15-64	1715	48									
1-64	1400	55				26-64	1005	46									
15-65	1510	68															

13. St. Mary River near Babb, Mont. (5-0175)

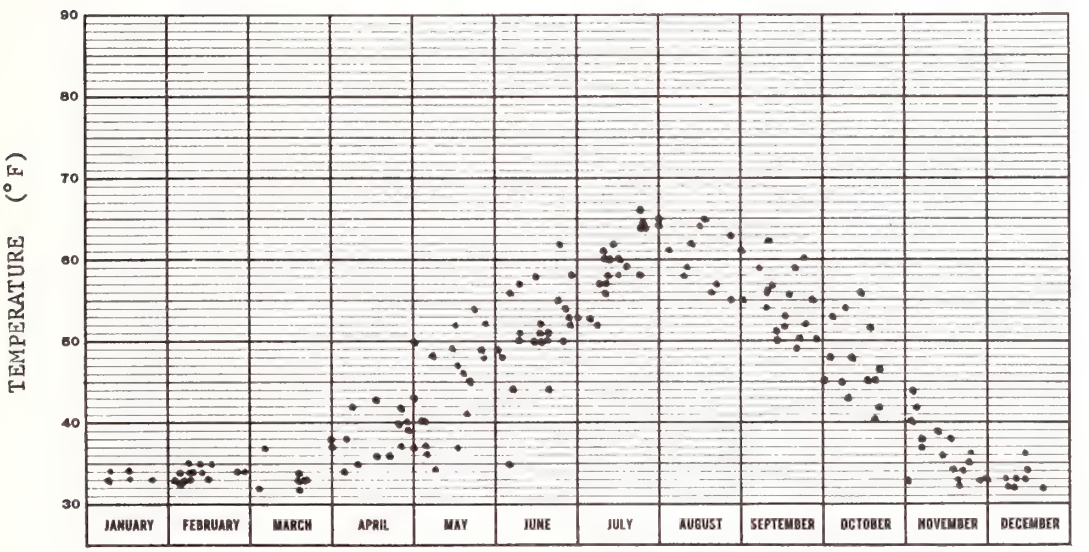
Location.--At gaging station, lat 48°50'00", long 113°25'00", in SE¼ sec.34, T.36 N., R.14 W., on right bank half a mile upstream from outlet of Lower St. Mary Lake and 2 miles southeast of Babb. Datum of gage is 4,468.13 ft above mean sea level, datum of 1929.

Drainage area.--278 sq mi.

Water temperature records available.--171 spot observations made at time of discharge measurements during period May 1949 to December 1965.

Extremes.--Discharge 1901-2, 1910-25, 1950-65: Maximum, 16,500 cfs June 9, 1964; minimum, 26 cfs Jan. 5, 1953, Jan. 8, 1958.
Water temperatures 1949-65: Maximum observed, 66°F July 27, 1960; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures are taken at cable and wading sections about 500 ft downstream from lake outlet and 1 mile downstream from gage. Water temperatures affected by natural storage in Upper and Lower St. Mary Lakes and in Lake Sherburne.



Spot observations of water temperatures, 1949-65

13. St. Mary River near Babb, Mont. (5-0175)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-52	1020	33	8-52	1100	33	18-51	1210	33	9-52	1400	42	7-49	--	48	8-50	--	44
17-56	1800	33	4-53	1415	34	5-52	1300	37	11-53	1920	35	3-50	--	36	29-50	--	52
24-57	1225	33	2-54	1700	33	18-55	1130	32	29-53	1840	39	17-50	--	37	20-51	1030	44
7-59	1745	34	25-54	1200	34	20-56	1820	33	5-54	1700	34	10-53	1500	34	4-52	1435	56
15-65	1345	34	5-55	1815	33	18-58	1745	34	30-56	1900	37	5-54	1120	40	25-52	1700	54
			14-57	1730	33	2-59	1850	32	22-57	1910	36	21-54	2000	41	5-53	1600	35
			4-58	1735	33	21-62	1915	33	30-57	1215	43	2-55	1845	37	17-54	1405	51
			9-60	1720	34	31-64	1715	38	28-58	1730	40	23-55	1330	45	20-56	1920	50
			13-62	1700	35	31-65	1720	37	27-60	1840	37	19-56	1840	46	10-57	1815	50
			9-63	1715	35				7-61	1300	38	28-56	1200	48	26-57	1910	55
			28-63	0950	34				18-62	1635	43	27-57	1835	49	19-58	1050	51
			13-64	1715	34				16-63	1840	36	16-58	1515	52	16-59	1935	52
			15-64	1630	35				27-64	1845	40	26-58	1935	52	30-59	1920	53
			10-65	1600	34				27-65	1935	42	3-60	1900	40	2-60	1200	48
												1-61	1820	50	9-60	1620	57
												26-61	1130	54	29-60	1520	58
												16-62	1135	47	15-61	1520	58
												15-64	1500	49	26-61	1000	62
															12-63	1840	51
															27-63	1125	53
															2-64	1905	50
															18-64	1845	50
															1-65	2015	49
															14-65	1645	50
July			August			September			October			November			December		
8-49	--	57	11-50	--	59	28-49	--	55	18-50	1400	45	14-49	--	36	16-50	1200	36
27-50	--	64	8-52	1020	58	21-50	--	59	2-51	1750	48	3-50	1700	38	7-53	1100	32
7-51	1720	53	2-54	1700	61	7-51	1800	59	16-53	1615	52	5-51	1350	37	6-54	1650	33
31-51	1430	64	24-54	1720	57	10-52	1225	54	9-54	1800	45	26-51	1400	35	10-57	1640	33
9-52	0845	57	15-55	1835	64	11-53	1500	62	19-55	1625	45	5-52	1635	42	7-59	1100	32
16-52	1000	60	27-56	1840	63	12-55	1910	57	23-56	1220	42	2-54	1730	40	13-61	1625	33
24-53	0940	58	27-57	1930	55	30-55	1815	45	21-57	1745	40	18-55	1650	34	21-63	1540	32
15-54	1540	58	11-59	1300	62	24-56	1805	52	13-59	1710	43	30-55	1635	33	16-65	1545	34
10-55	1845	52	31-61	1000	61	25-57	1715	60	21-60	1525	46	26-56	1615	36			
11-56	1145	56	17-62	1530	65	16-58	1505	53	4-62	1445	53	17-58	1705	33			
31-56	1810	65	19-64	1940	56	29-58	1810	50	14-63	1705	56	19-58	0950	34			
26-57	1800	64				15-59	1825	50	3-65	1745	48	30-60	1630	33			
16-58	2020	59				12-60	1900	56				1-61	1735	33			
14-59	2030	62				20-61	1900	49				13-62	1455	39			
11-60	1830	60				11-62	1030	51				20-63	1200	32			
27-60	1910	66				17-63	1730	56				18-64	1515	38			
11-61	1935	60				15-64	1445	52				2-65	1500	44			
9-62	1620	61				26-64	1430	50									
24-63	1530	64				1-65	1115	55									
13-65	1715	58															

14. St. Mary River at international boundary (5-0205)

Location.--At gaging station, lat 49°00'10", long 113°18'50", in SW¼ sec.5, T.1, R.25 W., fourth meridian, in Alberta, on right bank a quarter of a mile north of international boundary, 2½ miles downstream from Boundary Creek, 7 miles southwest of Kimball, Alberta, and 11 miles northeast of Babb, Mont. Altitude of gage is 4,120 ft (from topographic map).

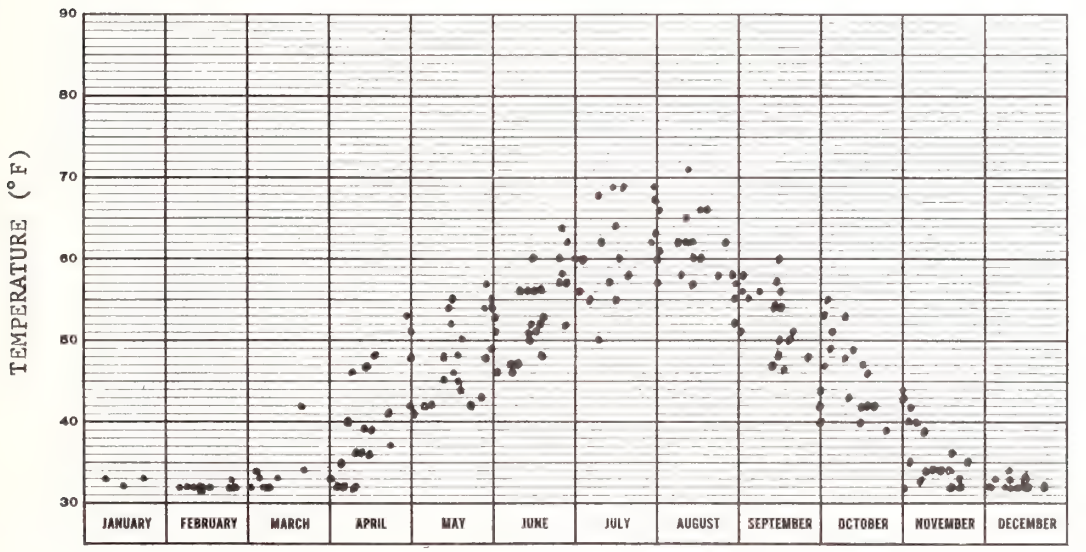
Drainage area.--469 sq mi.

Water temperature records available.--199 spot observations made at time of discharge measurements during period March 1949 to December 1965. Prior to October 1955, at sites about 8 miles downstream.

Extremes.--Discharge 1902-65: Maximum, about 40,000 cfs June 5, 1908; minimum daily, 16 cfs Nov. 29, 1936.
Water temperatures 1949-65: Maximum observed, 71°F Aug. 13, 1950; minimum, freezing point on many days during winter months.

Remarks.--No material difference in temperature of water at this site and site 8 miles downstream.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.



Spot observations of water temperatures, 1949-65

14. St. Mary River at international boundary (5-0205)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-62	1230	33	15-50	1130	32	2-49	1600	34	3-49	1930	32	27-54	1030	43	9-49	1130	56
21-64	1100	33	9-51	1800	32	5-52	1800	32	11-53	0830	32	24-55	1815	42	9-49	1730	47
14-65	1715	32	24-54	1100	32	6-59	1855	32	11-53	1140	36	5-56	1230	42	27-50	1300	52
			11-59	0930	32	21-61	0930	34	15-55	1145	36	16-56	1500	54	7-51	1615	47
			12-60	1145	32	13-62	1100	33	16-55	1000	39	19-56	1310	50	16-54	1130	48
			16-61	1330	32	1-63	1105	32	24-57	1800	41	31-56	1520	54	22-56	1135	53
			15-62	1320	32	19-63	1500	42	30-57	1525	51	15-58	1240	52	14-57	1100	51
			15-64	1440	32	5-64	1030	33	10-59	1700	46	29-58	1030	54	28-57	1145	62
			25-65	1630	33	11-65	1015	33	7-60	1030	40	15-59	1100	46	15-59	1850	56
						31-65	1120	33	28-60	1000	37	28-59	1530	48	1-60	1200	46
									4-62	0940	35	17-60	1120	45	14-60	1030	52
									12-62	0900	36	4-61	1440	42	28-60	1030	57
									15-63	1820	48	18-61	0900	44	15-61	1950	60
									29-63	1730	53	31-61	1000	49	28-61	1030	57
									3-64	1240	32	1-62	0900	41	13-62	0930	50
									15-64	1600	47	16-62	1645	55	27-62	0900	64
									30-64	0830	42	31-62	1700	55	12-63	1530	56
									8-65	1510	39	16-63	0900	48	15-63	1945	56
									30-65	1720	48	28-63	1800	57	28-63	1540	58
												14-64	1335	48	1-64	1250	51
												13-65	1015	45	9-64	1230	46
															23-64	1400	60
															1-65	1030	53
															15-65	1100	51
															18-65	1940	52
July			August			September			October			November			December		
6-51	1205	55	13-50	1600	71	19-50	0930	51	11-49	1830	43	4-50	1120	40	11-50	1730	33
9-52	1610	68	13-50	1800	65	19-50	1100	51	4-51	1350	49	4-50	1230	40	6-54	1500	33
21-54	1910	58	8-51	0955	62	10-51	1815	56	4-51	1420	51	7-51	1040	34	2-55	1325	32
11-55	1115	50	24-54	1210	58	4-52	1630	55	6-52	1650	53	7-52	1130	34	11-57	1750	32
12-56	1000	57	15-57	1800	60	16-55	1505	54	6-52	1705	52	7-52	1330	35	15-58	1515	33
30-56	1205	63	30-57	1150	57	30-55	1030	44	20-53	0940	42	27-56	1735	35	9-59	1225	32
15-58	1900	64	28-58	1240	62	14-56	0930	53	8-54	1800	48	19-58	1310	32	2-60	1035	32
30-58	1540	69	13-59	1930	62	27-56	1740	48	25-57	1740	39	2-60	1100	35	14-60	1030	32
1-59	1645	60	28-59	1030	55	16-58	1215	56	2-58	1620	55	1-61	1850	32	15-61	1420	32
16-59	1130	60	10-60	1130	58	16-59	0900	50	31-58	1330	44	15-61	0930	34	11-62	1500	34
30-59	1600	67	29-60	1700	58	30-59	1100	42	16-59	0950	40	24-61	1300	33	21-63	1300	32
14-60	1300	69	1-61	0900	61	14-60	1840	60	18-60	1130	42	7-62	1000	39	17-64	1415	32
29-60	0850	62	17-61	1050	66	1-61	1000	56	18-61	1805	46	15-62	1125	34	16-65	1125	32
17-61	1630	69	1-62	1530	66	13-61	0900	47	2-62	1820	57	6-63	0930	33			
13-62	1700	62	15-62	1130	62	14-62	1640	57	17-62	0930	42	21-63	1350	32			
16-63	0900	56	30-62	0900	52	17-63	0930	50	1-63	0930	53	3-64	1615	40			
31-63	0900	57	16-63	1345	66	1-64	1100	51	16-63	1020	47	18-64	1740	36			
1-64	1000	56	14-64	0930	57	15-64	1855	54	14-64	1045	49	2-65	1045	42			
31-64	1430	60	17-65	0940	60	1-65	1925	58	1-65	1050	40	17-65	1230	34			
1-65	1415	60				17-65	1115	46	20-65	1825	43						
15-65	1015	60															

15. Red Rock River at Kennedy Ranch, near Lakeview, Mont. (6-0110)

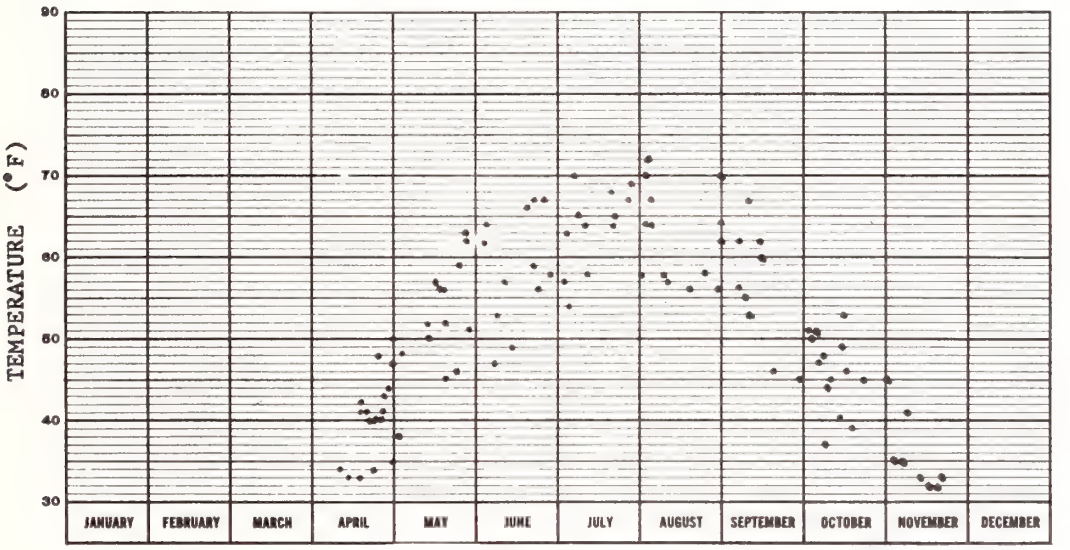
Location.--At gaging station, lat 44°39', long 112°03', near center of sec.2, T.14 S., R.4 W., on right bank at Kennedy Ranch, 4 miles upstream from Long Creek, and 14 miles northwest of Lakeview. Datum of gage is 6,596.37 ft above mean sea level, unadjusted.

Drainage area.--323 sq mi.

Water temperature records available.--99 spot observations made at time of discharge measurements during period August 1949 to December 1965 (no winter records).

Extremes.--Discharge 1936-65: Maximum recorded, 1,360 cfs Apr. 30, 1952; minimum, 1.5 cfs Sept. 2, 1940.

Water temperatures 1949-65: Maximum observed, 72°F Aug. 3, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

15. Red Rock River at Kennedy Ranch, near Lakeview, Mont. (6-0110)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
									19-50	1700	41	17-50	1100	57	13-50	1030	57
									30-52	1200	47	2-52	1200	48	4-52	1230	64
									30-53	1200	35	20-53	1130	45	8-53	0930	47
									28-54	1050	43	28-57	1145	63	9-54	1420	53
									25-57	0950	34	27-58	1030	59	16-55	1100	49
									30-58	1830	44	21-59	1600	52	26-57	1545	59
									22-59	1700	41	18-61	1240	50	23-59	1000	67
									19-60	1300	42	1-62	0930	38	2-60	1130	62
									26-60	1200	40	29-62	0900	51	23-61	1035	66
									19-61	1115	40	22-63	0800	56	27-62	1400	67
									24-62	0930	48	20-64	0930	56	25-63	1200	56
									17-63	0830	33	26-65	0845	46	29-65	1730	58
									30-63	1130	50						
									10-64	1310	34						
									14-65	1700	33						
									23-65	1140	40						
									28-65	0800	41						
July			August			September			October			November			December		
11-50	1830	65	31-49	1800	70	29-51	1200	45	12-49	1400	45	18-49	1130	32			
2-52	1300	63	2-50	1700	70	15-53	1230	62	14-52	1110	40	18-53	1040	32			
29-52	1325	67	31-50	1030	64	9-54	1520	62	16-53	1030	46	10-54	1400	41			
8-53	0820	64	30-51	1255	56	22-56	0930	46	4-55	1100	47	3-59	1100	35			
10-54	0930	58	11-53	1030	58	5-57	1000	56	19-56	0925	39	17-60	1325	32			
21-55	1200	65	12-54	1500	57	11-58	1400	55	2-57	1030	51	14-61	1340	33			
4-56	0910	54	31-55	1100	62	15-60	1320	60	14-58	1100	49	19-63	1045	33			
2-58	0930	57	23-56	0900	58	7-61	1015	53	7-59	1430	44	4-64	1135	35			
28-59	1630	69	6-57	1100	67	12-63	1700	67	10-61	1000	37						
7-60	1510	70	5-58	1000	64				2-62	1200	51						
22-64	1045	68	26-59	1230	56				30-62	1130	45						
20-65	0900	64	3-60	1710	72				16-63	1145	53						
			3-63	0900	64				8-64	1530	48						
			26-64	1330	58				2-65	1630	50						
									26-65	1535	46						

16. Red Rock River below Lima Reservoir, near Monida, Mont. (6-0125)

Location.--At gaging station, lat 44°39'20", long 112°22'00", in SW¼ sec.32, T.13 S., R.6 W., on right bank just downstream from Lima Reservoir, 7 miles northwest of Monida. Altitude of gage is 6,530 ft (estimated from spillway elevation based on Montana Water Conservation Board datum).

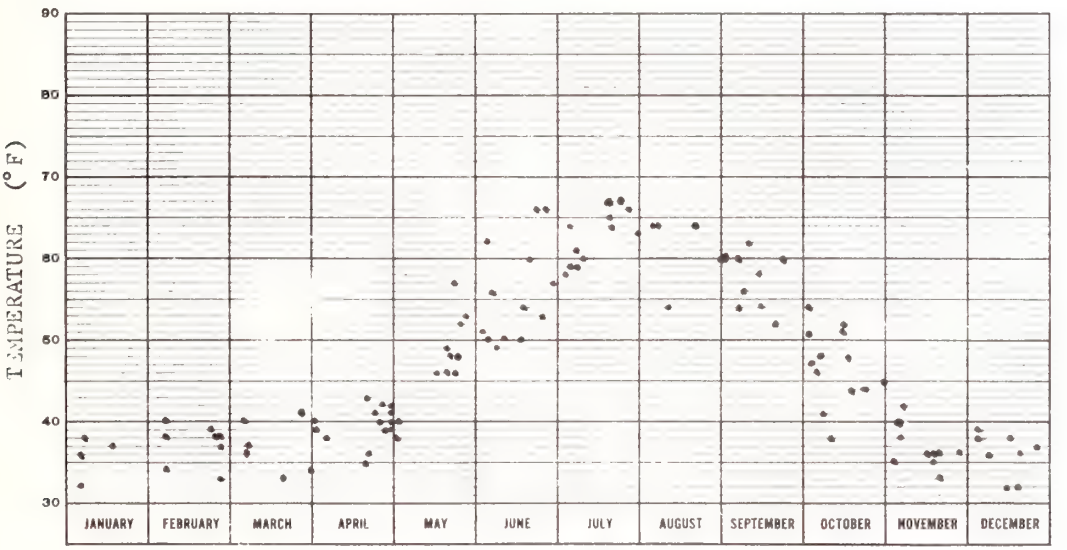
Drainage area.--570 sq mi.

Water temperature records available.--114 spot observations made at time of discharge measurements during period May 1950 to December 1965.

Extremes.--Discharge 1911-19, 1925-65: Maximum observed, 2,500 cfs May 15, 1933; no flow at times.

Water temperature 1950-65: Maximum observed, 67°F July 25, 1961, July 22, 1964; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures affected by storage in Lima Reservoir.



Spot observations of water temperatures, 1950-65

16. Red Rock River below Lima Reservoir, near Monida, Mont. (6-0125)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-57	1300	32	27-51	1100	38	4-54	1055	36	25-51	1600	41	17-50	1500	46	4-52	1500	50
18-61	1050	37	6-60	1000	38	30-54	1830	34	1-52	1430	40	20-53	1600	49	8-53	1520	49
5-63	1000	36	27-62	1030	33	30-55	1100	38	30-52	1630	41	28-57	1510	53	9-54	0950	50
6-65	1100	38	5-63	1000	40	19-57	1000	33	30-53	1700	39	1-58	1200	40	16-55	1500	50
			28-63	0930	38	4-59	1330	37	28-54	1510	42	27-58	1200	52	3-56	1310	62
			5-64	1030	34	29-63	0900	41	24-57	1150	36	21-59	1230	48	26-57	1830	53
			29-64	0945	37				23-59	1100	43	18-61	1800	46	23-59	1400	60
			25-65	1140	39				26-60	1530	40	1-62	1500	38	2-60	1625	51
									19-61	1740	35	22-63	1030	57	23-61	1510	66
									30-63	0800	42	20-64	1700	48	27-62	1000	66
									4-64	1430	38	26-65	1500	46	5-63	0800	56
									30-64	1700	40				20-64	1700	54
									1-65	0800	39				30-65	0830	57
									28-65	1330	39						
July			August			September			October			November			December		
2-52	1530	58	30-51	1700	60	24-50	1200	60	16-53	1510	48	7-51	1430	38	16-52	1015	38
30-52	1330	63	12-54	1200	54	15-53	1635	58	4-55	1300	46	18-53	1640	35	17-54	1100	32
8-53	1215	61	31-55	1300	60	9-54	1140	56	19-56	1215	44	10-54	1130	42	18-58	1030	36
10-54	1500	60	23-56	1230	64	22-56	1155	52	2-57	1300	54	22-55	1000	36	3-59	1230	39
21-55	1530	65	4-60	1200	64	5-57	1300	60	14-58	1430	51	3-59	1400	36	15-61	1100	32
4-56	1205	59	3-63	1400	64	15-60	1000	54	7-59	1800	41	17-60	1020	36	28-63	0930	37
2-58	1230	58	26-64	1700	59	7-61	1335	54	10-61	1340	37	14-61	1000	36	2-64	1200	38
28-59	1900	66				12-63	1855	62	2-62	0930	51	28-62	1330	36	9-65	1345	36
8-60	1630	64							30-62	1000	45	19-63	1330	33			
25-61	1010	67							16-63	1500	52	4-64	1440	40			
22-64	1400	67							8-64	1330	48						
20-65	1130	64							2-65	1230	47						
									26-65	1130	44						

17. Sheep Creek below Muddy Creek, near Dell, Mont. (6-0135)

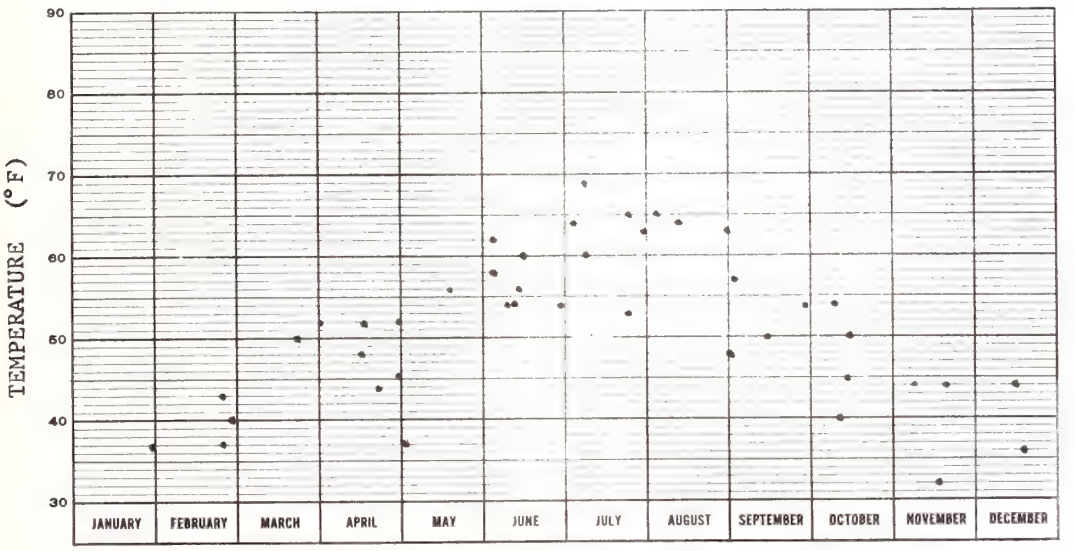
Location.--At gaging station, lat 44°39', long 112°47', in SW¼ sec.35, T.13 S., R.10 W., on left bank 2 miles downstream from Muddy Creek and 6 miles southwest of Dell. Altitude of gage is 6,530 ft (from topographic map).

Drainage area.--280 sq mi.

Water temperature records available.--41 spot observations made at time of discharge measurements during periods June 1949 to September 1953, June 1959 to December 1965.

Extremes.--Discharge 1936, 1946-53, 1960-65: Maximum observed, 909 cfs Apr. 18, 1952.
Discharge 1936, 1946-53: Minimum observed, 26 cfs May 11-13, 1936.
Water temperatures 1949-53, 1959-65: Maximum observed, 69°F July 8, 1953; minimum, freezing point at time during winter months.

Remarks.--Springs keep water temperatures well above freezing most winters.



Spot observations of water temperatures, 1949-53, 1959-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-52	1100	37	27-51	1400	40	25-53	1205	50	20-50	1100	44	17-50	1700	56	10-49	1700	54
			26-52	1100	37				1-52	1630	52	1-64	0900	37	13-50	1400	56
			26-53	1145	43				30-52	1745	52				4-52	0800	62
									30-53	1900	45				8-53	1855	54
									18-61	1740	52				16-53	1615	60
									17-62	1200	48				3-60	1030	58
															30-65	1200	54
July			August			September			October			November			December		
11-50	1300	60	2-50	1800	65	1-49	1200	57	11-49	1030	40	17-50	1500	32	18-51	1130	36
24-51	1630	53	31-50	1330	63	29-51	1600	54	14-52	1615	50	7-51	1730	44	16-52	1335	44
2-52	1800	64	31-51	1100	48	15-53	1010	50	7-53	1225	54	20-52	1525	44			
30-52	1805	63	11-53	1720	64												
8-53	1550	69															
25-61	1330	65															

18. Red Rock River near Dell, Mont. (6-0140)

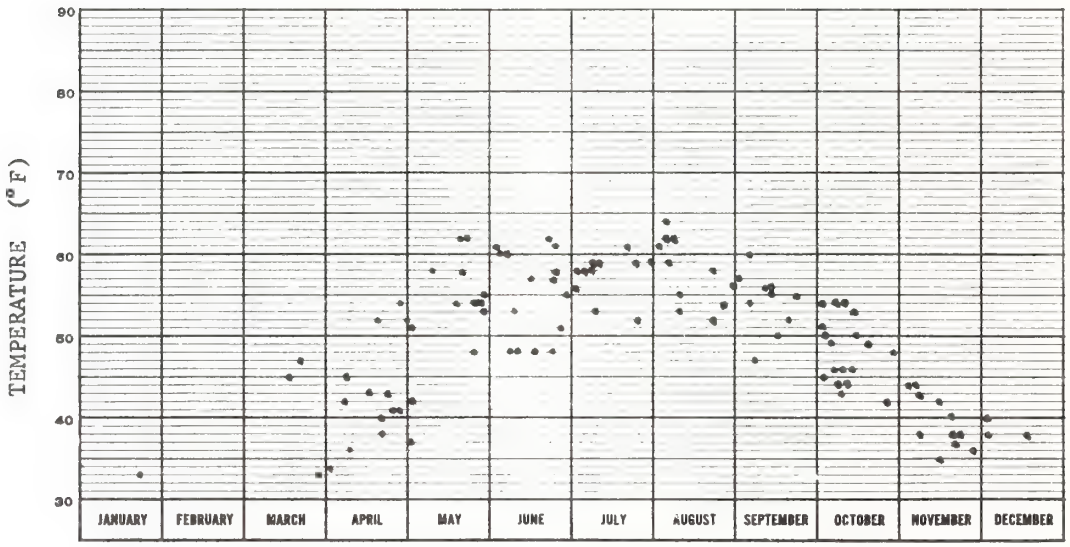
Location.--At gaging station, lat 44°47', long 112°44', in NW¼ sec.20, T.12 S., R.9 W., on right bank half a mile downstream from Sage Creek and 4½ miles northwest of Dell. Altitude of gage is 5,870 ft (by barometer).

Drainage area.--1,421 sq mi.

Water temperature records available.--108 spot observations made at time of discharge measurements during period September 1949 to December 1965 (no winter records).

Extremes.--Discharge 1942-65: Maximum, 1,480 cfs June 9, 1944; no flow May 16, 17, 1961.

Water temperatures 1949-65: Maximum observed, 64°F Aug. 5, 1958; minimum observed, 33°F Jan. 23, 1957, Mar. 28, 1962.



Spot observations of water temperatures, 1949-65

18. Red Rock River near Dell, Mont. (6-0140)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
23-57	1430	33				25-53	1400	47	30-52	0800	52	17-50	1830	54	13-50	1700	53
						19-57	1310	45	1-54	1130	34	1-53	0850	37	4-52	2100	60
						28-62	1100	33	28-54	1740	41	29-57	1040	55	9-53	0855	48
									27-55	1500	41	27-58	1630	54	16-53	1810	57
									24-57	1405	38	21-59	1030	58	10-54	0830	48
									9-58	1000	42	11-60	1635	58	16-55	1800	48
									23-59	1300	43	19-61	1325	62	3-56	1500	60
									8-60	1030	45	1-62	1800	51	27-57	0830	51
									18-61	1430	52	29-62	1830	53	24-59	1500	61
									16-63	1300	43	22-63	1300	62	3-60	1240	61
									29-63	1530	54	1-64	1200	42	23-61	2000	62
									11-64	0930	36	27-64	1000	54	27-62	1800	58
									22-65	1645	40	27-65	0930	48	25-63	1800	57
															21-64	0800	48
															29-65	1430	55
July			August			September			October			November			December		
11-50	1045	53	2-50	1900	61	1-49	1300	57	11-49	1130	43	18-49	1700	38	16-52	1430	38
25-51	1000	52	31-50	1430	56	24-50	1430	55	14-52	1730	46	8-51	1000	38	3-59	1500	38
2-52	0900	58	31-51	1400	56	16-53	0935	50	7-53	0925	46	20-52	1645	38	2-64	1515	40
31-52	1120	59	12-53	1020	53	9-54	0835	47	7-54	0900	49	10-54	0900	43			
8-53	1750	58	12-54	0930	55	22-56	1545	52	4-55	1530	50	22-55	1230	37			
10-54	1830	59	23-56	1420	58	5-57	1500	60	19-56	1435	49	3-59	1800	44			
21-55	0900	61	6-57	1630	59	11-58	1100	56	2-57	1600	54	16-60	1410	42			
4-56	1710	58	5-58	1500	64	14-60	1630	55	14-58	1500	53	15-61	0820	35			
2-58	1430	56	27-59	1100	54	7-61	1730	54	8-59	1230	44	28-62	1100	36			
8-60	2030	59	4-60	1830	62	12-63	1315	56	10-61	1645	44	19-63	1600	40			
25-61	0830	49	5-63	1400	62				2-62	1430	51	4-64	1630	44			
			26-64	0915	52				30-62	1500	48						
									16-63	1800	50						
									8-64	0830	46						
									2-65	0930	45						
									26-65	0825	42						

19. Red Rock River at Red Rock, Mont. (6-0145)

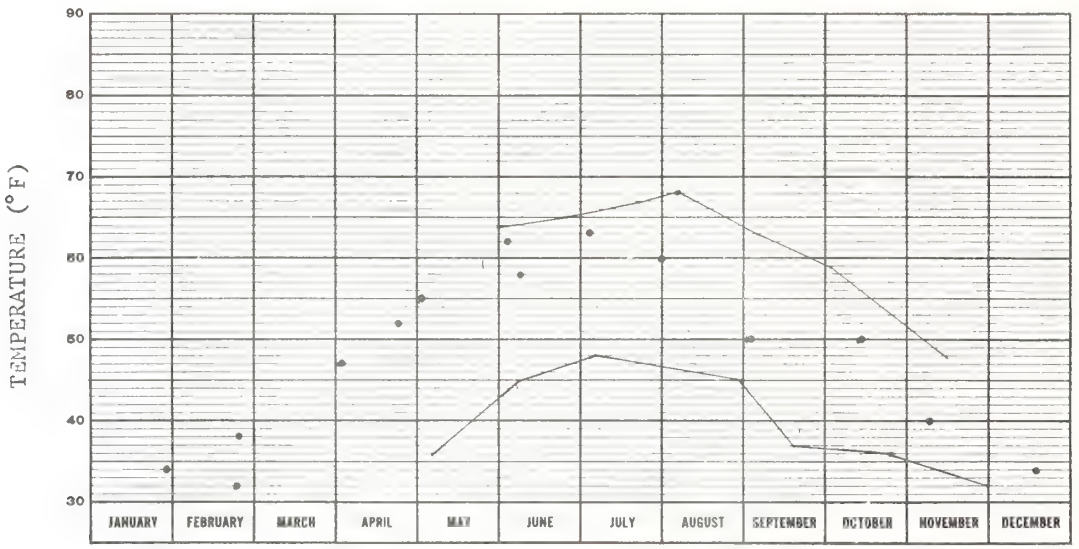
Location.--Lat 45°55', long 112°49', in SW¼ sec.34, T.10 S., R.10 W., at railroad bridge 120 ft upstream from bridge on Interstate Highway 15, at Red Rock, a quarter of a mile upstream from former gaging station. Altitude of gage is about 5,600 ft (by barometer).

Drainage area.--1,548 sq mi.

Water temperature records available.--14 spot observations made at time of discharge measurements during period October 1950 to September 1952. Thermograph record on a seasonal basis (May to October) during period June 1963 to November 1965 published in this report.

Extremes.--Discharge 1890, 1951-52: Maximum observed, 711 cfs June 28, 1952; minimum daily, 4.0 cfs May 24, 1951.
Water temperatures 1951-52, 1963-65: Maximum, 68°F Aug. 8, 1963; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph records furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1950-52.
The lines connect the highest and lowest monthly temperatures from seasonal thermograph records, 1963-65.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-52	1200	34	27-51	1530	38				24-51	1700	52	1-52	1800	55	8-51	1430	58
			26-52	1230	32				1-52	1830	47				5-52	1500	62
July			August			September			October			November			December		
3-52	1700	63				1-51	1000	50	13-50	1100	50	8-51	1130	40	18-51	1300	34
31-52	1445	60															

MISSOURI RIVER MAIN STEM

19. Red Rock River at Red Rock, Mont. (6-0145)

Water temperatures (°F), June to November 1963

Month	Day 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
June																																
Maximum.....	64	60	54	53	56	56	55	59	51	51	60	63	64	57	58	63	64	65	62	64	54	52	58	54	60	62	63	64	57	60	-	59
Minimum.....	52	52	50	49	48	48	50	49	48	48	49	50	51	53	52	50	53	52	53	54	52	48	49	50	48	48	50	50	49	46	-	50
July																																
Maximum.....	64	65	66	66	65	64	66	66	65	64	63	64	66	61	64	62	62	62	66	66	67	65	65	66	64	64	65	65	63	64	62	64
Minimum.....	48	52	50	50	50	50	52	52	52	51	48	50	50	52	50	49	50	49	49	52	50	52	50	52	51	50	50	51	51	50	49	50
August																																
Maximum.....	63	64	62	62	65	64	66	68	64	64	66	62	66	64	64	64	63	63	62	61	58	59	61	62	59	62	62	62	62	59	53	62
Minimum.....	50	50	50	52	51	52	54	54	56	56	54	55	52	54	52	52	51	51	50	50	50	49	48	50	48	47	48	50	49	49	52	51
September																																
Maximum.....	57	58	61	62	63	61	58	60	62	60	62	62	57	59	56	56	54	54	58	58	56	59	58	58	60	60	60	60	60	58	-	59
Minimum.....	52	50	48	48	50	52	53	54	50	50	50	51	52	50	50	48	48	48	52	50	52	50	52	48	48	48	48	47	48	48	-	50
October																																
Maximum.....	59	58	58	56	57	56	57	58	54	56	56	56	55	55	56	55	55	50	50	54	51	53	48	48	49	48	46	49	47	45	47	53
Minimum.....	48	46	48	48	49	50	46	46	50	45	45	48	46	45	44	43	42	44	44	47	44	46	47	40	44	38	36	40	42	42	37	45
November																																
Maximum.....	46	46	46	47	44	47	45	46	47	45	45	46	47	48	45	42	42	42	42	41	40	38	38	43	40	40	42	41	39	40	-	43
Minimum.....	38	40	42	42	39	43	38	41	42	39	38	39	42	43	42	37	36	37	37	39	34	34	36	36	35	36	36	34	32	32	-	38

Water temperatures (°F), May to November 1964

May																																
Maximum.....	--	--	--	--	--	--	--	53	58	55	59	60	60	59	61	60	58	62	62	62	63	63	62	56	62	55	63	55	52	61	64	59
Minimum.....	--	--	--	--	--	--	--	--	43	46	42	44	46	48	46	47	48	45	48	49	47	46	45	45	45	46	47	49	47	45	50	46
June																																
Maximum.....	62	58	65	58	60	59	54	55	52	53	55	59	54	52	57	55	53	55	55	59	57	61	64	65	62	65	64	58	63	61	-	58
Minimum.....	51	49	48	50	51	52	48	46	47	45	47	48	48	47	47	51	49	46	48	46	49	50	50	51	52	51	53	50	48	51	-	49
July																																
Maximum.....	63	63	63	63	62	64	66	64	62	65	--	--	60	63	65	66	65	65	64	65	65	66	64	64	66	66	66	64	64	63	64	64
Minimum.....	50	50	50	50	49	49	49	50	51	50	51	--	--	52	52	51	51	52	51	52	51	51	52	50	50	50	52	53	54	54	52	51
August																																
Maximum.....	62	64	65	65	65	64	60	63	64	64	63	58	62	64	63	64	61	62	54	58	60	61	61	61	60	56	57	52	56	56	60	61
Minimum.....	51	49	50	51	50	51	52	54	52	52	52	52	51	51	50	50	50	52	50	47	49	49	49	49	49	52	48	51	46	48	48	50
September																																
Maximum.....	57	54	58	59	59	58	58	58	57	56	57	58	58	56	58	58	58	55	55	50	54	56	56	58	60	58	49	54	54	54	-	56
Minimum.....	50	48	45	46	46	47	48	47	47	46	46	46	46	47	49	47	48	46	43	48	46	48	47	47	47	44	42	43	44	48	-	46
October																																
Maximum.....	51	54	54	52	52	54	55	50	52	52	52	54	54	53	49	49	46	48	50	51	50	50	50	50	48	48	46	48	48	46	48	50
Minimum.....	46	42	45	41	41	42	43	44	44	44	42	42	44	44	47	44	38	38	39	40	41	42	39	40	40	44	40	42	43	46	42	42
November																																
Maximum.....	46	46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	44	44	39	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--

MISSOURI RIVER MAIN STEM

19. Red Rock River at Red Rock, Mont. (6-0145)

Water temperatures (°F), May to November 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May																																
Maximum.....	51	48	50	48	43	40	42	45	50	54	55	56	58	50	53	56	53	53	52	56	49	48	46	48	50	52	57	59	56	59	54	51
Minimum.....	45	39	37	40	39	36	36	36	37	39	42	44	44	46	41	46	43	40	43	46	46	44	44	43	43	43	43	42	48	48	46	42
June																																
Maximum.....	57	60	60	59	60	58	60	60	61	62	63	56	54	56	52	52	56	53	60	60	60	61	58	56	54	56	59	56	58	57	-	58
Minimum.....	47	48	48	48	46	48	48	47	48	47	48	50	46	46	46	48	47	46	46	48	48	49	--	50	50	51	47	48	48	48	-	48
July																																
Maximum.....	56	62	62	60	62	64	60	62	61	63	62	59	63	64	64	64	62	60	61	62	62	62	65	64	59	60	62	62	61	64	64	62
Minimum.....	48	50	52	54	50	52	54	52	54	53	52	52	50	52	53	52	52	53	53	54	53	52	52	56	52	52	52	52	53	52	52	52
August																																
Maximum.....	65	65	60	60	62	64	64	63	61	60	64	64	64	63	60	60	62	62	60	61	59	57	56	58	60	58	60	58	56	56	59	61
Minimum.....	52	53	55	53	52	52	51	53	52	54	53	56	55	51	51	50	50	50	54	52	52	52	50	49	50	50	48	50	46	45	45	51
September																																
Maximum.....	59	59	56	56	51	51	55	54	52	56	55	54	52	52	50	43	44	49	49	51	47	46	49	52	53	52	46	44	49	50	-	51
Minimum.....	47	47	47	45	47	47	48	49	47	48	48	48	45	47	43	39	37	38	38	44	44	44	42	41	42	43	44	42	41	40	-	44
October																																
Maximum.....	53	53	53	52	51	52	52	54	54	52	52	51	50	51	45	48	46	47	48	47	49	50	49	48	48	48	48	47	48	50	48	50
Minimum.....	43	44	44	44	45	43	44	46	44	43	42	41	44	42	44	42	40	39	43	38	40	41	40	40	40	39	39	40	40	42	40	42
November																																
Maximum.....	48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	40	41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--

Summary of thermograph record

		May	June	July	Aug	Sept	Oct	Nov
1963	Max Min	-- --	65 46	67 48	68 47	63 47	59 36	48 32
1964	Max Min	64 42	65 45	66 49	65 46	60 42	55 38	-- --
1965	Max Min	59 36	63 46	65 48	65 45	59 37	54 38	-- --

Extremes for years 1963-65

	Max Min	64 36	65 45	67 48	68 45	63 37	59 36	48 32

20. Horse Prairie Creek near Grant, Mont. (6-0150)

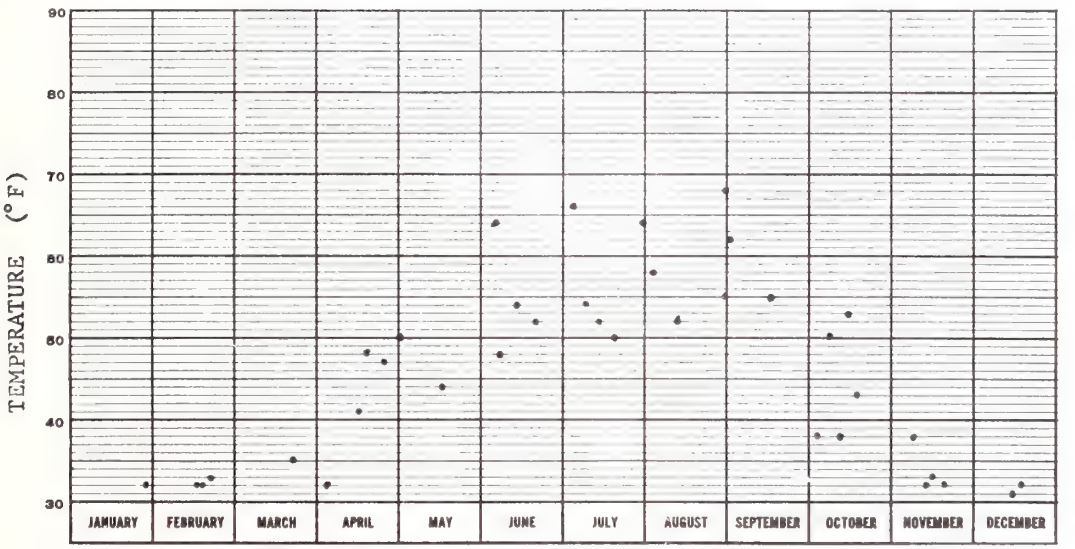
Location.--At gaging station, lat 45°00'50", long 113°13'30", in NE¼NW¼ sec.32, T.9 S., R.13 W., on left bank a quarter of a mile downstream from Bloody Dick Creek, 7½ miles west of Grant, and 17½ miles west of Armstead. Altitude of gage is 6,050 ft (from topographic map).

Drainage area.--325 sq mi.

Water temperature records available.--37 spot observations made at time of discharge measurements during period September 1949 to October 1953.

Extremes.--Discharge 1946-53: Maximum, 1,360 cfs June 2, 1953; minimum daily, 12 cfs Nov. 26, 28, 1952.

Water temperatures 1949-53: Maximum observed, 68°F Aug. 31, 1950; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-52	1500	32	27-51	1830	33	25-53	1625	35	20-50	1400	41	18-50	1400	44	5-52	1700	64
			26-52	1550	32				24-51	1530	48	1-52	1600	50	6-53	1530	48
			26-53	1550	32				3-52	1530	32				9-53	1205	54
									29-53	1800	47				16-53	1045	52
July			August			September			October			November			December		
11-50	0800	52	3-50	1000	58	1-49	1530	62	11-49	1300	38	19-49	1330	33	18-51	1630	32
25-51	1330	50	31-50	1700	68	16-53	1135	55	12-50	1800	53	18-50	1100	32	16-52	1645	32
3-52	1800	66	31-51	1830	55				3-51	1700	38	8-51	1400	38			
31-52	1735	64	12-53	0830	52				17-52	1800	43	21-52	0930	32			
9-53	0705	54							7-53	1545	50						

21. Horse Prairie Creek below Medicine Lodge Creek, near Grant, Mont.

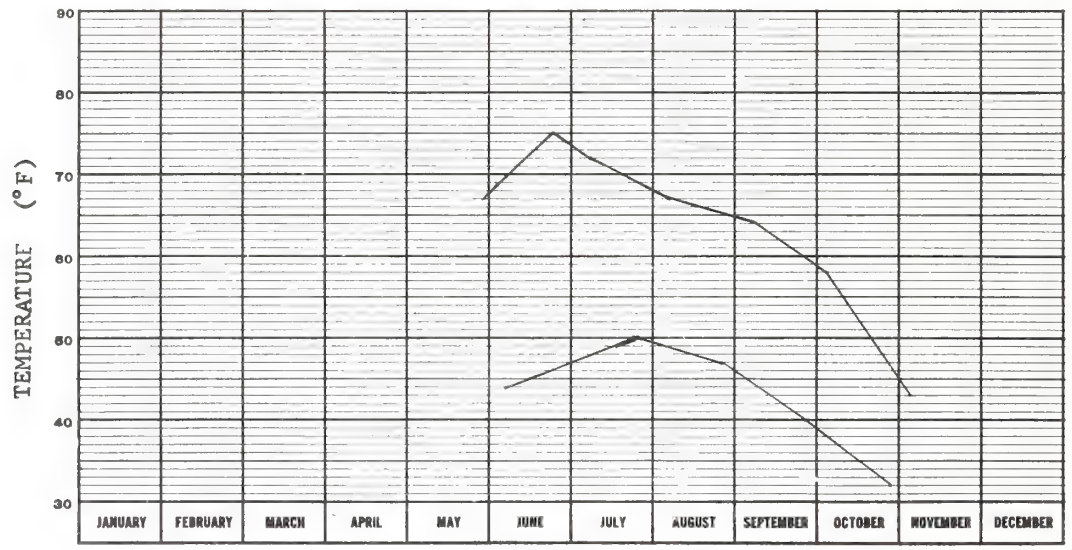
Location.--At thermograph site, lat 44°59', long 112°57', in W½ sec.10, T.10 S., R.11 W., at county bridge just downstream from Medicine Lodge Creek, about 6½ miles east of Grant. Elevation is about 5,575 ft (from topographic map).

Water temperature records available.--Thermograph record on a seasonal basis (May to November) during period August 1963 to November 1964 published in this report.

Extremes.--Water temperatures 1963-64: Maximum, 75°F June 24, 1964; minimum, probably freezing point on many days during winter months.

Remarks.--Flow may be completely depleted during summer months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



The lines connect the highest and lowest monthly temperatures from seasonal thermograph record, 1963-64

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	--	--	--	--	--	--	--	64	58	42	--
	Min	--	--	--	--	--	--	--	48	47	32	32	--
1964	Max	--	--	--	--	67	75	72	67	60	52	--	--
	Min	--	--	--	--	--	44	50	47	40	33	--	--

HORSE PRAIRIE CREEK BASIN

21. Horse Prairie Creek below Medicine Lodge Creek, near Grant, Mont.

Water temperatures (°F), August to November 1963

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
August																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64	64	61	63	63	64	65	61	54	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	51	51	48	50	52	51	52	54	--
September																																
Maximum.....	60	59	62	63	64	64	60	63	64	62	64	63	58	60	56	56	54	55	60	61	58	60	59	58	60	60	59	59	58	56	-	60
Minimum.....	52	52	50	50	52	54	56	56	54	54	52	52	54	50	50	48	47	47	52	53	54	52	53	48	48	48	48	48	48	48	-	51
October																																
Maximum.....	57	56	58	56	56	55	56	54	54	54	54	54	53	51	51	50	50	46	45	50	46	48	47	42	44	41	38	40	41	40	38	49
Minimum.....	47	46	48	50	48	51	46	45	49	44	44	46	45	43	42	42	41	40	42	44	42	42	42	36	40	35	32	32	36	36	32	42
November																																
Maximum.....	38	39	40	40	37	40	38	39	40	40	39	38	39	42	40	37	34	35	34	34	33	33	32	33	33	33	33	33	33	33	-	36
Minimum.....	32	33	35	37	33	36	32	35	36	33	33	33	34	36	37	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	33

Water temperatures (°F), May to November 1964

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	62	60	60	63	63	63	62	61	60	50	58	53	60	56	57	67	66	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	47	47	46	49	48	47	45	45	46	43	46	47	50	46	46	51	--
June																																
Maximum.....	63	61	70	59	68	64	61	59	50	57	58	62	72	64	68	62	58	61	54	60	53	68	74	75	70	71	70	64	70	72	-	64
Minimum.....	52	52	51	55	54	56	52	46	48	44	48	49	52	57	56	58	54	50	50	48	51	48	54	59	60	58	59	55	54	58	-	53
July																																
Maximum.....	67	68	70	70	67	69	71	72	69	70	71	68	66	66	69	70	69	68	68	70	70	68	69	68	69	69	70	66	66	63	67	68
Minimum.....	59	58	58	58	56	55	58	58	59	56	59	60	61	59	58	58	58	59	57	58	57	56	56	53	53	50	55	57	57	57	55	57
August																																
Maximum.....	64	65	66	66	66	66	67	65	66	65	66	61	66	66	66	65	64	66	55	54	62	63	64	64	61	57	59	55	55	57	59	63
Minimum.....	54	51	54	53	53	53	54	56	54	53	53	55	54	54	53	53	53	54	52	48	48	50	51	52	50	52	48	52	47	48	48	52
September																																
Maximum.....	58	52	57	58	59	58	58	58	57	56	57	57	58	57	60	60	58	56	53	50	54	57	56	58	54	51	52	53	53	54	-	56
Minimum.....	52	48	44	46	47	49	49	47	47	45	45	46	46	47	50	46	48	46	41	46	46	48	47	47	48	43	40	42	43	47	-	46
October																																
Maximum.....	51	51	53	49	49	50	52	47	49	52	49	50	50	50	47	45	43	42	44	45	45	45	44	42	40	41	40	42	43	44	45	46
Minimum.....	45	40	45	40	39	40	41	42	41	42	40	40	40	42	45	42	34	34	34	35	36	38	34	34	33	36	34	36	38	42	39	39
November																																
Maximum.....	42	43	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	40	40	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--

22. Beaverhead River near Armstead, Mont. (6-0154)

Location.--At gaging station, lat 45°00'10", long 112°51'10", in NW¼SW¼SE¼ sec.32, T.9 S., R.10 W., on right bank 1,500 ft downstream from Clark Canyon Dam, 1½ miles upstream from Clark Canyon Creek, and 2 miles north of Armstead. Altitude of gage is 5,445 ft (from topographic map).

Drainage area.--2,322 sq mi.

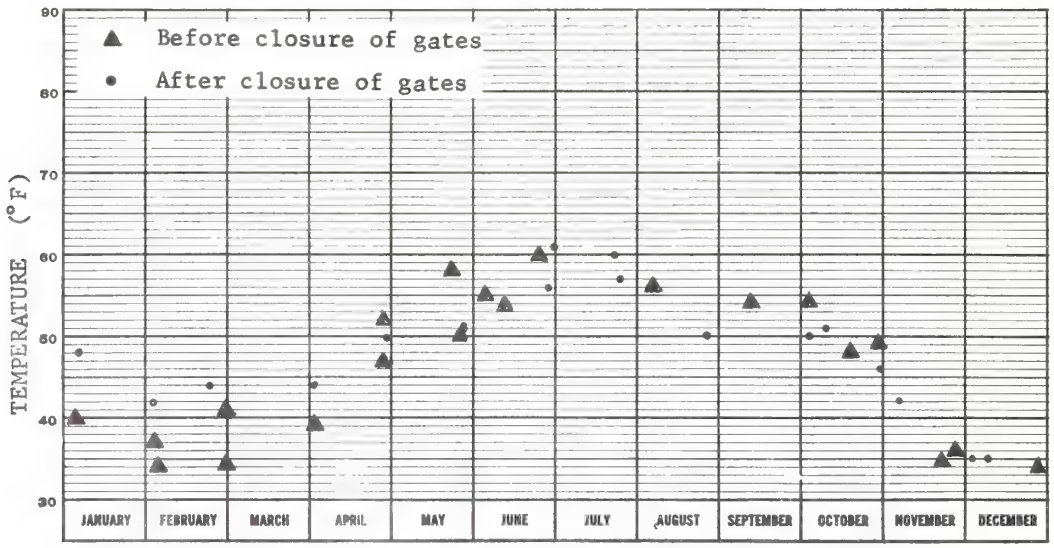
Water temperature records available.--39 spot observations made at time of discharge measurements during period October 1962 to December 1965. Thermograph record on a seasonal basis during period May to October 1965 published in this report.

Extremes.--Discharge 1962-65: Maximum, 2,110 cfs Feb. 7, 1963; minimum, 20 cfs Sept. 3, 1965.

Water temperatures 1962-65: Maximum, 61°F June 30, 1964, Aug. 22, 28, 1965; minimum observed, 34°F Dec. 28, 1963, Feb. 5, 29, 1964.

Remarks.--Water temperatures since June 1964 affected by storage in Clark Canyon Reservoir. Water is drawn from bottom of reservoir.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1962-65

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1965	Max	--	--	--	--	50	56	58	61	60	49	--	--
	Min	--	--	--	--	44	47	54	56	47	44	--	--

22. Beaverhead River near Armstead, Mont. (6-0154)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-63	1300	40	4-63	1530	37				29-63	1400	47	21-63	1530	58	5-63	1400	55
6-65	1400	48	28-63	1200	41				2-64	0920	39	27-64	0730	50	6-63	1630	55
			5-64	1300	34				29-64	1400	52	27-65	1500	51	26-63	1530	60
			29-64	1210	34				1-65	1100	44				12-64	1100	54
			3-65	1415	42				29-65	1200	50				30-64	0830	61
			25-65	1400	44										29-65	1130	56
July			August			September			October			November			December		
23-64	1030	60	5-63	1130	56	12-63	1045	54	2-62	1630	54	28-62	0900	36	28-63	1300	34
21-65	0745	57	27-64	0930	50				30-62	1700	49	22-63	0815	35	3-64	0900	35
									17-63	0730	48	5-64	0905	42	9-65	1005	35
									9-64	1130	51						
									3-65	1530	50						
									30-65	1500	46						

Water temperatures (°F), May to October 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May																																
Maximum.....	48	48	48	48	48	48	48	48	47	47	47	47	48	47	48	48	47	48	47	48	47	47	48	47	48	49	50	50	49	50	49	48
Minimum.....	47	46	46	46	46	45	46	46	44	44	44	44	44	44	44	44	44	45	44	46	46	45	45	45	47	46	46	47	47	46	47	45
June																																
Maximum.....	48	50	50	49	51	49	50	50	50	50	50	50	50	51	50	51	55	55	52	53	54	54	54	54	54	54	56	54	54	54	-	52
Minimum.....	47	48	48	48	48	48	48	48	48	48	49	49	48	49	49	49	50	51	52	52	52	52	52	52	52	53	53	53	54	54	-	50
July																																
Maximum.....	54	55	55	55	55	55	55	55	55	56	56	56	56	56	56	56	56	56	56	56	56	57	57	57	56	57	56	57	57	58	58	56
Minimum.....	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	56	55	55	55	55	55	55	56	56	56	56	56	56	56	56	56	55
August																																
Maximum.....	58	58	58	58	58	59	58	58	58	58	60	60	60	60	60	59	60	60	60	60	60	61	60	60	60	60	60	61	60	60	60	59
Minimum.....	56	56	56	57	57	57	58	58	58	58	58	58	58	58	58	58	58	59	59	59	59	59	58	59	58	59	59	59	59	59	58	58
September																																
Maximum.....	60	60	58	58	58	58	57	56	56	56	56	56	55	55	54	54	53	51	50	50	50	49	50	50	49	48	48	48	48	48	-	53
Minimum.....	58	57	56	56	56	57	56	56	55	55	55	55	54	54	54	53	50	50	50	49	49	48	48	48	48	48	47	47	47	47	-	52
October																																
Maximum.....	48	48	48	49	48	49	49	49	49	48	48	48	48	48	48	48	48	47	47	46	46	46	46	46	46	46	46	46	46	45	45	47
Minimum.....	48	48	47	48	48	48	48	48	48	48	48	48	48	48	48	47	46	46	46	46	46	46	45	45	45	45	45	45	45	44	44	47

23. Grasshopper Creek near Dillon, Mont. (6-0155)

Location.--At gaging station, lat 45°06'40", long 112°48'00", in SW¼NW¼ sec.26, T.8 S., R.10 W., on left bank 1¼ miles upstream from mouth and 11 miles southwest of Dillon. Altitude of gage is 5,350 ft (from topographic map).

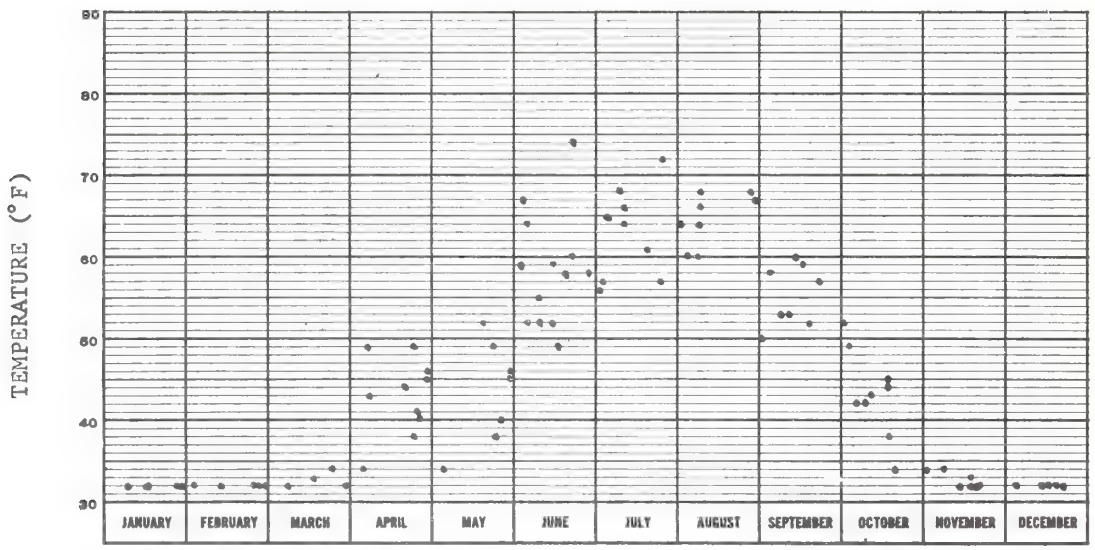
Drainage area.--348 sq mi.

Water temperature records available.--89 spot observations made at time of discharge measurements during periods August 1949 to December 1953, March 1955 to September 1958, October 1959 to December 1965.

Extremes.--Discharge 1921-33, 1945-53, 1955-58, 1959-65: Maximum, 1,870 cfs Mar. 24, 1956.

Discharge 1921-33, 1945-53, 1955-58: No flow July 5-11, Aug. 3, 1930, Aug. 5, 6, 1931.

Water temperatures 1949-58, 1959-65: Maximum observed, 74°F June 22, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures , 1949-53, 1955-58, 1959-65

23. Grasshopper Creek near Dillon, Mont. (6-0155)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-52	1700	32	26-51	1530	32	26-53	0920	34	24-51	1330	49	18-50	1300	47	16-50	1300	59
13-57	1530	32	26-52	1700	32	29-55	1730	32	3-52	1700	34	24-50	1430	54	23-50	1700	60
30-58	1000	32	27-53	0950	32	19-57	1605	33	29-52	1830	46	26-55		50	5-52	1100	64
18-61	1630	32	15-61	0940	32	6-58	1000	32	29-53	1700	45	11-57	1240	51	6-53	1730	52
			4-63	1100	32				27-55	1730	40	27-57	1620	58	9-53	1620	55
									24-57	0945	38	26-58	2000	58	15-53	1600	52
									8-58	1430	43	20-61	0905	52	16-55	2000	49
									8-60	1330	49				2-56	1530	59
									27-60	1200	41				27-57	0935	58
									18-61	1055	44				3-60	1605	67
															22-61	1650	74
															12-64	0945	52
															17-65	1730	58
July			August			September			October			November			December		
12-50	1910	66	29-49	1800	67	23-50	1630	57	20-49	1200	34	19-49	1500	33	5-50	0930	32
25-51	1600	57	3-50	0800	60	1-51	1100	50	3-51	1530	42	1-50	0930	34	19-51	1130	32
3-52	1530	65	29-50	1700	68	16-53	1320	59	18-52	0915	38	8-51	1600	34	17-52	1030	32
9-53	1020	64	1-52	1015	64	21-56	1600	52	17-53	0800	45	21-52	1145	32	15-53	0940	32
21-55	1800	61	12-53	1255	64	4-57	1400	58	4-55	1730	49	19-53	1150	32	14-56	1425	32
2-58	1600	57	6-57	1800	68	11-58	0930	53	18-56	1500	44	22-55	1430	32			
9-60	1155	68	4-58	1900	60	14-60	1230	60	1-57	1900	52	16-60	1150	32			
25-61	1605	72	10-60	1330	66	9-61	0950	53	7-59	1030	42						
1-65	0945	56							11-61	1100	43						

24. Beaverhead River at Barretts, Mont. (6-0160)

Location.--At gaging station, lat 45°06'59", long 112°45'00", in SE¼ sec.19, T.8 S., R.9 W., on left bank 1 mile upstream from Barretts, 1½ miles downstream from Grasshopper Creek, and 8¼ miles southwest of Dillon. Datum of gage is 5,268.00 ft above mean sea level, datum of 1929.

Drainage area.--2,737 sq mi.

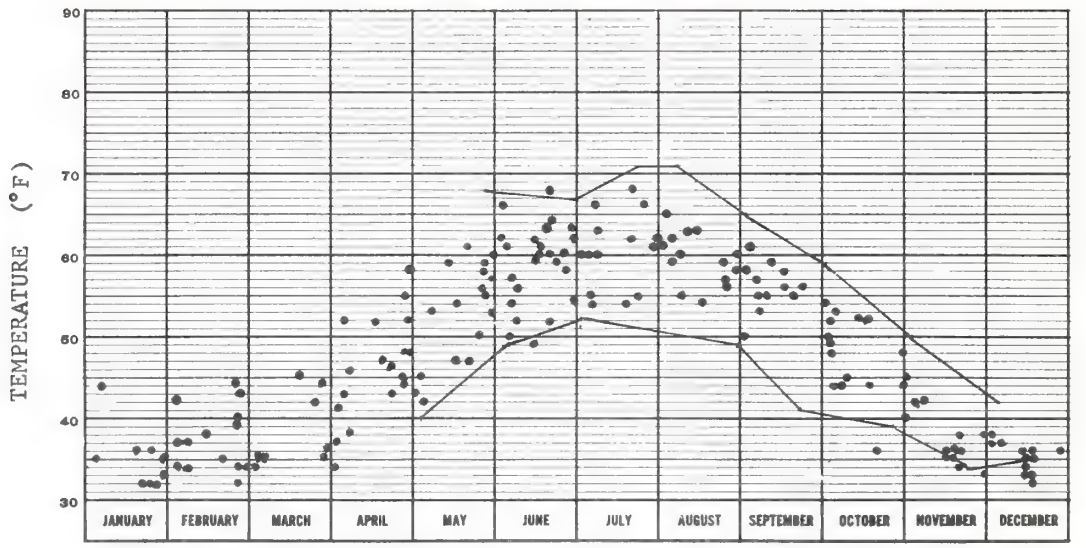
Water temperature records available.--171 spot observations made at time of discharge measurements during period August 1949 to December 1965. Thermograph record on a seasonal basis (May to November) during period May 1963 to October 1965 published in this report. Once-daily observations during period July to December 1965 at site 1 mile downstream published in reports of the Geological Survey.

Extremes.--Discharge 1907-65: Maximum, 3,720 cfs June 20, 1908; minimum recorded, 69 cfs Jan. 30, 1938.

Water temperatures 1949-65: Maximum recorded, 71°F July 23, Aug. 8, 1963; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures affected by springs upstream from station and, since June 1964, by storage in Clark Canyon Reservoir.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1949-65.
The lines connect the highest and lowest monthly temperatures from once-daily observations, 1965, and seasonal thermograph record, 1963-65.

24. Beaverhead River at Barretts, Mont. (6-0160)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-52	1800	35	26-51	1610	39	1-50	0805	34	21-50	0710	46	4-50	0930	42	12-50	1830	57
21-54	1130	32	26-52	1900	34	26-53	1200	42	17-51	1850	52	15-50	1830	59	16-50	1500	59
26-55	1330	36	27-53	1525	43	4-54	1430	35	3-52	1800	43	18-50	1130	47	26-50	1730	60
30-58	0900	33	22-56	1230	35	29-55	1500	36	29-52	0800	48	31-50	1940	60	7-51	1300	50
22-59	1030	32	5-60	1600	34	19-57	1650	45	29-53	1515	48	24-50	1600	50	19-51	1945	63
18-61	1735	36	15-61	1100	38	6-58	1130	35	1-54	1300	34	1-51	1900	43	5-52	1330	61
24-62	1330	32	27-62	1630	32	28-62	0800	35	29-54	1500	52	26-53	1805	56	6-53	2000	54
5-63	1430	35	5-63	1230	37	27-63	1230	44	27-55	1900	45	11-57	1415	53	9-53	1830	56
6-65	1600	44	6-63	1500	37				23-57	1820	43	29-57	0900	57	15-53	1900	62
			27-63	1600	40				8-58	1600	46	27-58	2000	55	17-53	1145	61
			5-64	1400	34				8-59	1000	38	20-59	1730	47	10-54	1145	52
			29-64	1430	34				8-60	1530	52	17-61	1820	54	15-55	1830	49
			3-65	1700	42				27-60	1300	44	2-62	0730	45	2-56	1045	62
			25-65	1700	44				18-61	0930	47	30-62	0930	53	19-57	1335	60
									29-63	1300	52	21-63	1400	61	22-59	2000	64
									2-64	1100	41	27-64	1300	59	3-60	1735	66
									29-64	1630	58	27-65	1845	58	22-61	1455	68
									2-65	0900	37				28-62	0900	58
									28-65	1800	55				26-63	1400	59
															19-64	0730	52
															30-64	1030	62
															29-65	0900	54
July			August			September			October			November			December		
8-50	1930	55	29-49	1930	60	7-50	0815	55	4-49	1645	52	1-49	1555	45	17-52	1130	35
12-50	1945	63	17-50	0720	54	18-50	1650	55	20-49	1300	36	30-49	1930	38	15-53	1100	36
20-50	0820	54	29-50	1800	58	23-50	1800	56	3-51	1430	44	1-50	1045	40	16-54	1500	32
31-50	1740	62	15-51	1700	63	1-51	1530	50	18-52	1015	44	21-51	1600	34	16-56	1350	33
26-51	0900	55	1-52	1215	61	5-51	1600	61	16-53	1710	52	21-52	1245	36	18-58	1430	36
3-52	1400	60	12-53	1445	63	17-51	1735	56	5-55	1130	48	19-53	1525	35	2-59	1700	37
7-53	1820	66	11-54	1530	55	16-53	1500	58	1-57	1630	54	9-54	1800	42	14-60	1410	34
11-54	1030	60	24-56	0740	57	10-54	0805	53	15-58	1430	52	22-55	1600	38	15-61	1420	33
20-55	1830	62	6-57	1900	62	4-57	1600	58	8-59	1500	44	16-60	0955	36	28-63	1700	36
5-56	0725	54	6-58	1000	59	10-58	1900	57	11-61	0955	45	15-61	1020	35	3-64	1200	38
3-58	0830	60	25-59	1730	59	14-60	1050	58	3-62	1030	49	30-62	0900	33	8-65	1400	37
29-59	1930	61	10-60	1155	60	9-61	0840	55	31-62	1030	44	22-63	1200	36			
25-61	1735	66	2-63	1730	66	13-63	1000	55	17-63	1700	52	5-64	0945	42			
23-64	1400	68	27-64	1215	56				6-64	1800	53						
21-65	1020	59							3-65	1030	50						
									30-65	1030	48						

MISSOURI RIVER MAIN STEM

24. Beaverhead River at Barretts, Mont. (6-0160)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), May to November 1963																																
May																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66	62	62	64	65	66	68	68	64	65	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54	55	54	54	56	56	56	58	58	--
June																																
Maximum.....	65	63	61	54	57	56	56	60	54	54	61	65	66	64	60	64	65	66	66	65	63	57	57	54	57	61	64	64	61	59	-	61
Minimum.....	58	58	56	54	52	55	54	54	53	51	52	59	62	60	60	56	62	61	63	61	54	52	54	53	52	55	59	60	56	52	-	56
July																																
Maximum.....	63	66	67	66	68	68	69	68	67	66	64	65	68	65	66	64	62	64	67	70	70	70	71	70	70	67	69	70	69	68	68	67
Minimum.....	52	60	60	60	60	60	61	62	62	60	57	58	59	61	58	58	58	57	58	62	62	62	60	61	62	57	57	59	58	58	56	59
August																																
Maximum.....	68	68	65	67	68	68	70	71	66	69	68	64	67	67	67	67	66	66	65	64	62	61	62	64	62	63	64	64	64	62	57	65
Minimum.....	58	57	57	58	58	60	60	62	62	60	60	61	58	62	59	59	58	57	57	56	56	54	54	55	56	52	54	56	56	56	56	58
September																																
Maximum.....	60	60	62	64	64	65	60	62	64	64	64	62	58	59	55	55	54	56	60	60	58	60	59	59	60	60	60	60	60	58	-	60
Minimum.....	54	55	53	55	56	58	58	58	57	58	55	57	56	53	52	52	51	51	54	54	56	54	55	52	52	52	53	53	52	53	-	54
October																																
Maximum.....	59	58	58	56	58	55	56	56	56	56	56	55	56	55	54	54	54	52	48	52	51	51	49	46	47	46	44	46	45	45	44	52
Minimum.....	52	52	52	53	52	54	50	50	52	49	49	50	50	49	48	47	46	46	46	48	47	47	48	43	44	42	39	40	42	42	40	47
November																																
Maximum.....	44	43	45	44	44	44	44	43	45	44	43	43	45	46	45	42	39	38	39	39	37	38	37	39	39	38	38	38	37	37	-	41
Minimum.....	39	40	40	42	40	40	40	40	42	41	40	40	41	43	42	38	36	36	36	37	35	36	36	35	37	36	35	35	34	34	-	38
Water temperatures (°F), May to November 1964																																
May																																
Maximum.....	48	46	44	49	53	52	51	54	57	57	58	61	59	60	63	63	61	63	62	60	63	62	62	56	59	57	61	57	53	57	62	57
Minimum.....	--	43	41	41	44	47	45	46	46	50	48	49	51	52	51	52	53	51	53	53	52	51	50	50	48	50	51	52	50	51	52	49
June																																
Maximum.....	62	61	63	62	63	63	58	52	52	54	55	58	61	62	62	61	58	60	55	59	54	60	64	67	66	66	65	64	66	67	-	61
Minimum.....	56	50	55	58	56	58	52	50	50	49	50	51	53	56	55	58	56	54	54	51	52	51	54	58	60	61	60	58	58	57	-	55
July																																
Maximum.....	68	68	68	68	66	66	69	68	68	68	70	70	66	66	67	69	70	67	70	70	68	68	69	68	68	69	70	67	67	65	68	68
Minimum.....	59	58	60	59	60	58	60	61	60	60	62	62	--	60	60	60	61	61	60	60	60	60	60	58	58	59	60	60	61	61	58	60
August																																
Maximum.....	62	66	66	67	68	68	65	66	68	68	66	64	65	66	65	66	66	65	61	--	61	63	64	62	62	57	60	56	57	58	58	64
Minimum.....	59	55	57	58	58	58	59	58	59	60	58	59	56	58	57	57	57	57	51	--	--	54	56	56	54	55	51	54	50	49	51	56
September																																
Maximum.....	56	56	60	60	62	62	60	62	61	60	60	58	54	59	63	62	60	60	61	61	58	59	59	61	57	55	56	57	56	56	-	59
Minimum.....	52	50	48	50	52	52	52	51	52	50	49	48	51	51	54	51	53	51	50	50	52	51	50	51	51	47	46	47	48	50	-	50
October																																
Maximum.....	55	55	56	54	54	55	56	52	54	55	54	55	55	54	51	50	48	49	50	51	51	51	50	49	48	48	46	48	49	48	49	52
Minimum.....	49	45	49	46	45	45	45	47	48	49	45	46	46	48	50	48	42	42	42	42	43	44	42	42	42	44	42	43	44	47	45	45
November																																
Maximum.....	48	48	45	46	46	46	46	46	44	45	43	42	40	40	39	39	42	42	42	41	40	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	45	45	40	40	41	40	41	42	41	42	41	39	38	37	34	34	38	39	39	39	38	--	--	--	--	--	--	--	--	--	-	--

MISSOURI RIVER MAIN STEM

24. Beaverhead River at Barretts, Mont. (6-0160)

Water temperatures (°F), May to October 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May																																
Maximum.....	56	54	56	53	51	46	50	54	57	58	61	62	62	54	58	58	58	57	56	60	54	49	50	54	52	56	60	61	62	63	58	56
Minimum.....	49	45	44	46	45	40	44	44	40	46	47	49	50	51	48	50	47	46	48	51	49	48	47	48	48	47	48	52	53	53	52	48
June																																
Maximum.....	60	62	64	62	62	62	60	61	62	61	61	58	56	55	54	53	60	59	60	62	61	65	63	61	58	59	62	61	60	61	-	60
Minimum.....	52	52	53	53	52	54	53	54	54	54	54	55	52	51	52	52	52	54	53	55	55	55	56	56	56	56	54	54	54	54	-	54
July																																
Maximum.....	59	63	64	64	63	65	62	64	64	65	64	62	64	65	65	65	65	62	63	63	62	65	65	63	61	66	64	64	65	66	66	64
Minimum.....	56	55	56	57	56	56	57	56	57	58	56	56	55	56	56	56	57	57	56	57	56	56	57	58	57	56	58	57	58	58	58	57
August																																
Maximum.....	66	66	64	64	65	66	66	66	64	64	67	66	66	66	65	65	67	67	63	66	63	62	64	65	65	65	66	64	64	65	65	65
Minimum.....	58	58	59	58	58	58	58	59	59	59	60	60	60	58	59	59	58	59	60	60	59	59	59	59	59	59	58	59	58	58	58	59
September																																
Maximum.....	65	65	63	61	58	58	61	60	59	59	60	59	58	58	56	54	56	55	55	54	52	51	54	55	55	54	52	50	52	53	-	57
Minimum.....	57	58	55	53	53	57	57	57	56	55	55	56	54	55	52	51	50	50	50	50	50	50	49	49	49	49	48	48	48	48	-	52
October																																
Maximum.....	54	54	54	54	54	58	55	55	55	54	54	53	53	54	50	52	51	52	51	51	52	52	52	51	51	51	51	50	50	51	50	53
Minimum.....	48	49	49	49	48	49	50	50	49	49	49	50	50	49	50	48	48	47	48	47	46	47	46	46	46	46	46	46	46	46	46	48

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1965	Max Min	-- --	-- --	-- --	-- --	-- --	-- --	67 60	68 62	63 49	56 44	50 36	42 35

Summary of thermograph record

1963	Max Min					68 --	66 51	71 52	71 52	64 51	59 39	46 34	
1964	Max Min					63 41	67 49	70 58	68 49	63 46	56 42	48 34	
1965	Max Min					63 40	64 51	66 55	67 58	65 48	58 46		

Extremes for years 1963-65

	Max Min					68 40	67 49	71 52	71 49	65 46	59 39	50 34	

25. Blacktail Deer Creek near Dillon, Mont. (6-0175)

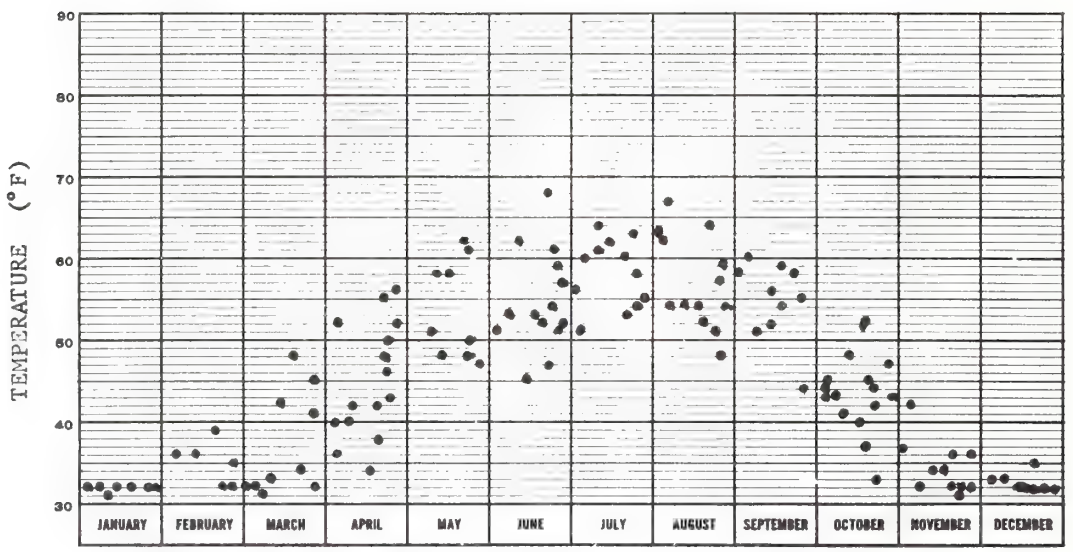
Location.--At gaging station, lat 45°02'45", long 112°32'55", in SE¼ sec.14, T.9 S., R.8 W., on left bank 12½ miles southeast of Dillon and 14 miles upstream from mouth. Datum of gage is 5,667.59 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Drainage area.--312 sq mi.

Water temperature records available.--134 spot observations made at time of discharge measurements during periods August 1949 to December 1953, April 1955 to December 1965.

Extremes.--Discharge 1946-53, 1955-65: Maximum, 426 cfs June 8, 1964; minimum, 5.6 cfs Nov. 9, 1952.

Water temperatures 1949-53, 1955-65: Maximum observed, 68°F June 21, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1955-65

25. Blacktail Deer Creek near Dillon, Mont. (6-0175)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
31-52	1200	32	28-51	1500	35	30-53	1210	41	24-51	0930	38	26-55	1110	62	13-50	2000	45
30-58	1100	32	28-52	1130	32	30-55	1730	32	4-52	0900	36	27-57	1815	61	23-50	1900	54
21-59	1500	32	27-53	1745	32	18-57	1600	42	29-52	1610	50	28-58	0900	50	4-52	0900	53
19-61	1730	32	14-61	1700	36	6-58	1250	33	29-53	1350	43	20-59	1830	48	10-53	1505	62
25-62	1000	32	4-65	0815	36	4-59	0930	32	23-57	1250	42	17-61	1550	51	15-55	1600	53
4-63	1500	32	26-65	1700	39	2-62	0930	32	8-58	1130	42	30-62	0730	47	2-56	1930	51
7-65	1130	32				28-62	1430	34	7-59	1700	40	21-63	1300	58	25-57	1935	59
						26-63	1530	48	5-60	1730	52	19-64	1900	58	24-59	2000	61
						1-64	1705	32	27-60	1600	48	28-65	0645	48	4-60	0910	53
						30-65	1645	45	20-61	0910	34				21-61	1810	68
									30-62	1730	52				28-62	0800	52
									30-63	1530	56				24-63	1630	51
									3-64	1745	40				21-64	1100	47
									28-64	1730	56				30-64	0530	57
									27-65	1530	55				17-65	2000	52
July			August			September			October			November			December		
12-50	1650	62	29-49	1600	59	23-50	1930	55	20-49	0930	33	19-49	1700	36	19-51	1530	32
26-51	1300	54	2-50	1300	62	27-51	0830	44	14-52	0900	37	1-50	1230	37	17-52	1635	32
2-52	0930	51	31-50	0830	54	16-53	1655	59	17-53	1000	45	9-51	0830	32	15-53	1545	32
9-53	1530	61	28-51	1200	56	1-55	1530	58	5-55	0930	43	21-52	1615	31	28-55	1530	32
21-55	1930	60	1-52	1535	63	20-56	1330	58	18-56	1120	44	19-53	1720	32	14-56	1120	32
3-56	2005	60	11-53	0700	52	4-57	1700	60	3-57	1945	45	23-55	1030	32	17-58	1400	35
1-58	1600	56	22-56	1600	64	11-58	2000	56	13-58	1510	52	18-60	0930	34	14-60	1715	32
28-59	0900	55	7-57	0900	54	16-60	1240	54	8-59	1630	41	15-61	1210	34	16-61	1020	32
9-60	1625	64	4-58	1700	67	9-61	1530	51	11-61	0805	40	27-62	1400	36	29-63	1715	32
26-61	0805	58	26-59	0900	51	11-63	0750	52	3-62	0830	44	21-63	1600	32	4-64	1010	33
23-64	1930	63	10-60	1005	54				31-62	0900	43	5-64	1500	42	8-65	1610	33
22-65	0745	53	5-63	0715	54				18-63	0745	42						
			28-64	1815	48				9-64	1630	48						
									3-65	1700	43						
									30-65	1630	47						

26. Beaverhead River at Blaine, Mont. (6-0185)

Location.--At gaging station, lat 45°23'00", long 112°27'10", in SW¼NW¼SE¼ sec.22, T.5 S., R.7 W., on left bank at downstream side of bridge on State Highway 41, 11½ miles upstream from Ruby River, and 14½ miles northeast of Dillon. Altitude of gage is 4,810 ft (by barometer).

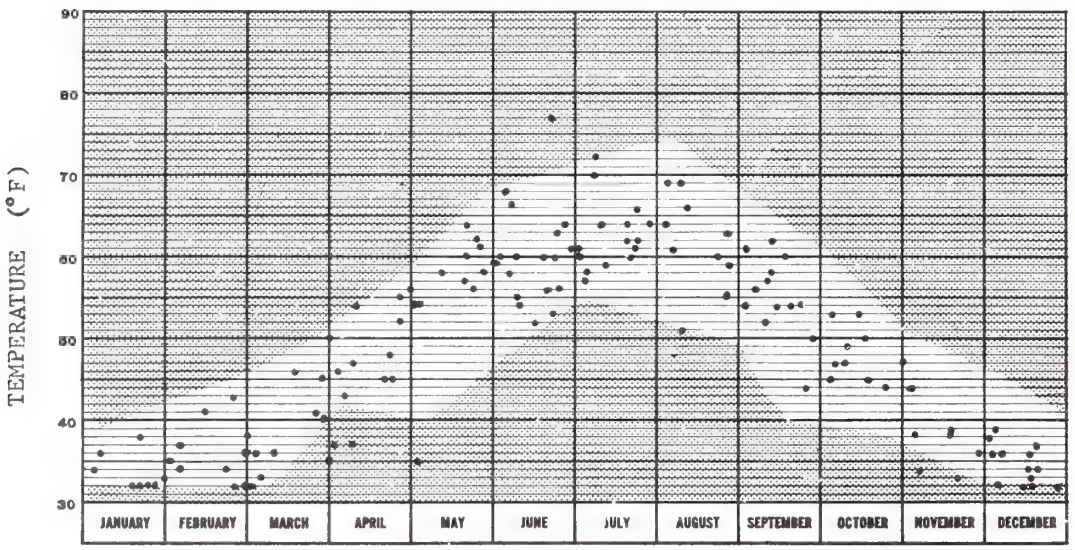
Drainage area.--3,619 sq mi.

Water temperature records available.--144 spot observations made at time of discharge measurements during period September 1949 to December 1965. Thermograph record on a seasonal basis (May to November) during period May 1963 to October 1965 published in this report. Once-daily observations made during period July 1962 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1935-65: Maximum observed, 3,130 cfs June 12, 1944; minimum observed, 7.0 cfs May 25, 1940.

Water temperatures 1949-65: Maximum observed, 77°F June 21, 1961, minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the highest and lowest monthly temperatures from once-daily observations, 1962-65, and seasonal thermograph record, 1963-65.

26. Beaverhead River at Blaine, Mont. (6-0185)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
21-54	1545	32	28-51	1200	32	1-53	0950	32	23-51	1730	48	26-50	1130	56	12-50	1800	55
26-55	1530	32	1-52	1100	35	30-53	0845	40	4-52	1100	43	1-52	1300	54	26-50	2100	63
23-57	1030	32	25-52	1700	34	5-54	1130	33	28-53	1700	49	26-53	1600	56	3-52	1800	68
31-58	0800	33	4-60	1700	37	9-55	1000	36	1-54	1630	37	1-54	0925	35	11-53	1120	60
22-59	1530	32	15-61	1350	41	31-55	1000	35	23-57	1500	45	29-57	1310	61	17-53	1000	60
20-61	0915	32	26-62	1630	32	18-57	1500	46	8-58	0930	47	28-58	1300	62	10-54	1530	54
24-62	1600	32	5-63	1630	34	3-59	1500	36	7-59	1500	37	20-59	1530	60	15-55	1400	52
5-63	1630	34	28-63	1500	38	28-62	1700	41	8-60	1900	54	12-60	0930	58	2-56	1845	60
7-65	1530	36	29-64	1700	36	28-63	1630	45	20-61	1145	45	20-61	1910	64	25-57	1610	53
20-65	1430	38	26-65	1430	43	31-65	1600	50	30-63	1730	56	2-62	1400	54	25-59	0930	60
									2-64	1315	46	31-62	1200	59	4-60	1230	66
									28-64	1330	52	21-63	1030	57	21-61	1540	77
									27-65	1400	55	28-65	1045	58	28-62	1130	64
															6-63	1430	58
															26-63	1100	56
															19-64	1100	56
															30-65	1715	61
July			August			September			October			November			December		
10-50	1910	64	29-51	1800	59	15-49	1200	54	18-52	1145	45	3-49	1100	38	5-50	1400	32
23-51	2030	61	12-53	1825	69	1-50	0900	54	17-53	1240	50	29-51	1000	36	18-52	0930	34
1-52	2000	60	11-54	1730	51	25-50	1330	54	6-55	1000	47	18-52	1000	38	16-53	1450	36
7-53	1635	72	24-56	1000	60	27-51	1200	44	3-57	1120	45	9-54	0930	41	16-54	1700	32
11-54	1330	59	5-57	1930	69	14-53	1745	62	15-58	0930	53	5-59	1630	34	16-56	1145	34
20-55	1600	64	6-58	1200	61	10-54	1655	52	11-61	1430	49	18-60	1305	39	18-58	1530	37
5-56	1200	58	28-59	1330	63	1-55	1730	61	3-62	1430	53	21-63	0730	33	2-59	1000	36
3-58	1100	57	10-60	1945	67	21-56	0930	54	31-62	1300	47	5-64	1200	44	15-60	1025	32
30-59	0900	64	2-63	1130	64	6-57	0900	56	18-63	1715	50				16-61	1555	33
6-60	1945	70	28-64	1430	55	10-58	1730	57	9-64	0900	47				1-62	1000	38
26-61	1115	67				16-60	1605	60	27-65	1000	44				29-63	1330	32
23-62	0930	60				10-61	1220	57							3-64	1700	39
1-64	0930	61				11-63	1045	58							7-65	1605	36
24-64	0940	62				29-65	1700	50									
21-65	1330	62															

MISSOURI RIVER MAIN STEM

26. Beaverhead River at Blaine, Mont. (6-0185)

Water temperatures (°F), May to November 1963

Month	Day 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
May																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	65	65	61	66	66	64	68	68	63	67	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54	56	54	54	56	54	56	57	58	--
June																																
Maximum.....	66	64	64	62	57	60	59	60	54	53	60	64	68	62	62	64	66	67	--	--	--	--	--	--	--	63	64	64	58	60	-	62
Minimum.....	57	58	57	56	53	51	54	54	53	51	50	54	56	60	57	54	58	57	--	--	--	--	--	--	--	--	55	57	55	50	-	55
July																																
Maximum.....	63	66	67	68	68	68	70	70	67	58	64	66	68	64	66	66	64	64	69	70	72	71	72	70	71	66	70	71	70	69	69	68
Minimum.....	53	57	58	58	58	58	58	59	59	56	54	56	56	60	56	56	57	56	56	60	60	60	60	62	59	57	56	59	58	58	57	58
August																																
Maximum.....	69	70	69	70	73	72	73	74	70	72	72	65	70	70	69	69	68	68	67	67	65	62	64	65	63	64	64	66	65	62	56	67
Minimum.....	58	56	57	59	58	61	62	63	62	61	60	60	57	61	58	57	57	56	56	56	54	54	52	54	54	52	52	54	54	54	55	57
September																																
Maximum.....	62	60	62	63	64	65	63	60	64	64	63	62	59	57	55	54	54	56	60	61	58	60	60	58	58	60	60	59	59	57	-	60
Minimum.....	54	54	50	52	54	55	58	58	54	55	54	55	56	52	50	50	50	48	54	53	56	52	54	50	50	51	51	51	50	50	-	53
October																																
Maximum.....	58	58	56	57	56	54	56	56	55	56	55	56	56	54	54	54	53	50	48	52	50	50	48	47	47	45	43	44	44	44	43	52
Minimum.....	50	50	50	50	50	52	48	48	51	48	47	50	48	47	46	45	44	44	46	47	46	46	47	40	43	40	38	38	42	42	38	46
November																																
Maximum.....	43	43	44	44	42	44	41	44	44	44	41	42	43	45	44	2	39	38	38	39	36	36	38	39	38	39	38	36	36	36	-	41
Minimum.....	38	40	40	42	40	40	38	40	39	40	38	39	39	41	42	38	36	36	36	36	33	32	36	36	35	36	36	32	33	32	-	37

Water temperatures (°F), May to November 1964

May																																
Maximum.....	49	48	45	47	51	51	52	52	56	57	58	61	60	60	63	63	61	64	64	62	63	62	63	56	64	55	61	56	56	59	62	57
Minimum.....	--	45	42	41	45	46	46	47	47	51	47	50	53	53	53	52	52	51	53	54	51	50	49	49	49	49	50	54	49	47	52	49
June																																
Maximum.....	61	60	65	60	64	62	58	55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	53	52	52	55	53	56	53	49	49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
July																																
Maximum.....	--	--	67	66	64	66	68	70	66	68	70	68	68	70	65	69	69	68	70	69	66	70	68	--	69	70	71	69	69	66	69	68
Minimum.....	--	--	--	58	58	57	58	60	59	58	60	60	60	60	57	59	57	61	59	60	59	59	58	59	58	59	60	60	60	58	58	59
August																																
Maximum.....	65	67	68	70	70	70	68	66	68	68	67	62	65	67	68	67	67	66	57	60	62	64	64	62	60	56	58	55	55	56	58	64
Minimum.....	54	57	58	58	57	58	59	57	56	56	--	58	55	55	56	56	56	57	54	51	52	54	54	54	53	55	49	54	49	50	50	55
September																																
Maximum.....	57	54	57	58	59	59	58	58	58	56	56	57	58	57	60	58	57	56	54	50	54	54	56	58	56	52	52	53	54	52	-	56
Minimum.....	53	50	47	49	50	51	52	50	51	49	48	49	49	51	51	51	50	49	46	49	48	49	48	48	50	44	44	45	48	49	-	49
October																																
Maximum.....	51	51	52	50	50	52	53	50	50	52	51	52	52	52	49	48	45	44	46	48	50	49	48	47	46	47	45	47	48	48	48	49
Minimum.....	46	44	40	44	42	43	45	48	46	46	44	44	44	44	45	44	39	38	38	40	42	43	42	40	41	44	41	40	42	47	44	43
November																																
Maximum.....	46	46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	45	45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--

26. Beaverhead River at Blaine, Mont. (6-0185)

Water temperatures (°F), May to October 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May																																
Maximum.....	56	53	54	52	50	46	48	52	54	56	58	61	61	54	57	59	57	58	58	62	54	53	50	56	54	57	60	65	64	64	61	56
Minimum.....	49	46	44	46	45	40	40	43	46	47	49	51	52	53	48	52	50	46	50	52	51	48	47	48	49	48	48	53	57	55	54	49
June																																
Maximum.....	65	66	68	64	68	68	65	66	67	68	69	66	59	56	55	54	60	58	62	62	60	64	64	61	56	58	61	61	60	62	-	62
Minimum.....	55	56	57	56	54	56	54	54	57	56	56	57	53	50	50	52	51	53	53	54	55	54	55	54	55	53	52	53	52	52	-	54
July																																
Maximum.....	58	63	64	64	64	66	64	67	67	66	66	63	64	68	69	70	67	62	64	64	62	65	66	67	64	66	66	68	68	68	68	65
Minimum.....	54	52	56	58	57	57	60	57	58	58	57	57	54	56	58	59	62	58	55	57	56	55	56	57	58	56	57	57	58	59	58	57
August																																
Maximum.....	68	70	66	63	67	67	68	68	66	66	68	67	66	66	65	66	66	66	62	65	62	60	60	61	62	62	62	60	58	58	59	64
Minimum.....	58	59	62	58	57	57	58	59	58	58	56	62	59	56	58	58	56	58	59	57	57	56	55	55	55	54	54	56	52	51	51	57
September																																
Maximum.....	60	60	58	56	53	52	56	58	55	56	54	56	53	53	52	46	46	48	50	50	--	--	--	53	53	52	48	46	50	51	-	53
Minimum.....	52	53	53	50	50	50	50	53	53	51	52	52	50	50	46	42	40	41	42	48	48	--	--	--	47	46	46	44	43	43	-	48
October																																
Maximum.....	52	53	53	53	52	--	--	53	54	52	52	51	52	50	49	48	46	48	48	--	48	49	49	49	48	48	47	47	48	48	48	50
Minimum.....	45	46	46	47	49	--	--	--	47	47	46	45	47	46	46	43	42	42	46	--	--	44	44	44	43	42	42	43	44	43	42	45

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max	--	--	--	--	--	--	--	72	64	56	48	38
	Min	--	--	--	--	--	--	--	52	50	43	32	32
1963	Max	38	45	46	58	66	65	73	73	67	60	45	37
	Min	32	35	32	43	47	55	62	63	60	44	37	32
1964	Max	37	38	50	58	66	69	71	71	58	54	45	46
	Min	32	32	35	42	47	55	66	53	53	45	33	32
1965	Max	39	45	47	56	64	68	69	72	64	54	50	38
	Min	32	34	36	47	51	63	59	58	46	47	38	34

Summary of thermograph record

1963	Max	--	--	--	--	--	--	68	68	72	74	65	58	45	--
	Min	--	--	--	--	--	--	--	50	53	52	48	38	32	--
1964	Max	--	--	--	--	--	--	64	--	71	70	60	53	--	--
	Min	--	--	--	--	--	--	41	--	57	49	44	38	--	--
1965	Max	--	--	--	--	--	--	65	69	70	70	60	54	--	--
	Min	--	--	--	--	--	--	40	50	52	51	40	42	--	--

Extremes for years 1962-65

	Max	39	45	50	58	68	69	73	74	67	60	50	46
	Min	32	32	32	42	40	50	52	49	40	38	32	32

27. Ruby River above Warm Springs Creek, near Alder, Mont. (6-0190)

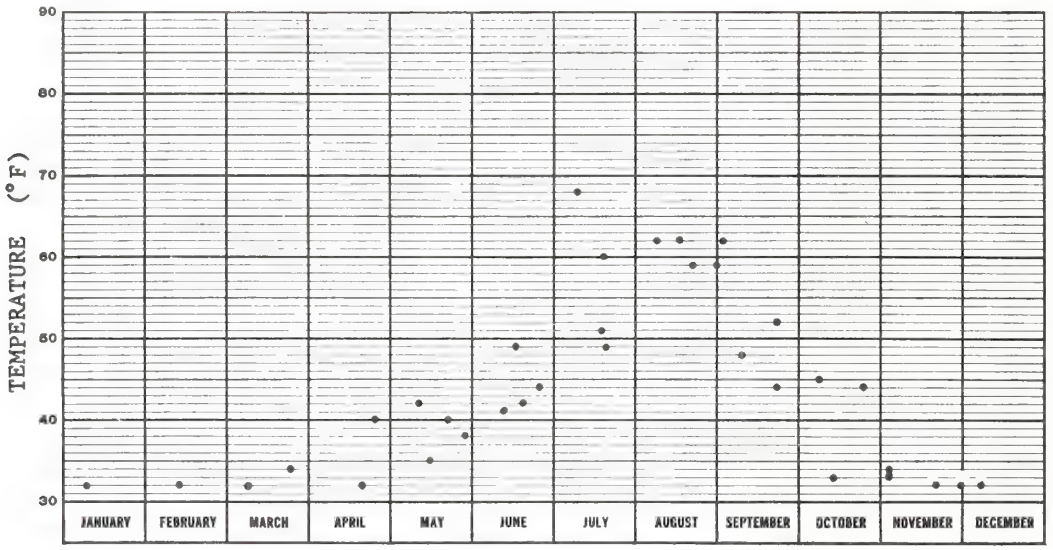
Location.--At gaging station, lat 44°59'40", long 111°57'50", in NW¼ sec.3, T.10 S., R.3 W., on right bank 2½ miles upstream from Warm Springs Creek and 24 miles south of Alder. Altitude of gage is 6,200 ft (from topographic map).

Drainage area.--145 sq mi.

Water temperature records available.--34 spot observations made at time of discharge measurements during period August 1949 to October 1953 (no winter records after 1951).

Extremes.--Discharge 1948-53: Maximum, 1,230 cfs May 3, 1952; minimum recorded, 6.8 cfs Nov. 5, 1950.

Water temperatures 1949-53: Maximum observed, 68°F July 8, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
9-51	1100	32	14-51	1210	32	8-50	0930	32	19-50	1030	32	16-50	1030	35	20-50	0930	42
						24-53	1035	34	28-53	1100	40	30-50	0945	38	26-51	1100	44
												13-52	1010	42	13-52	1000	41
												21-53	1645	40	17-53	1900	49
July			August			September			October			November			December		
20-50	0925	49	31-49	1300	59	26-50	1000	44	26-51	1200	44	2-49	1100	33	6-50	1115	32
19-51	1100	60	16-50	1435	62	26-51	1430	52	14-52	1000	33	30-49	1500	32			
18-52	0945	51	23-51	1100	59	9-52	0915	48	6-53	1140	45	2-50	1000	34			
8-53	1600	68	8-52	1140	62	1-53	1000	62				19-52	1050	32			

28. Ruby River above reservoir, near Alder, Mont. (6-0195)

Location.--At gaging station, lat 45°10'30", long 112°08'50", in SW¼SW¼ sec.31, T.7 S., R.4 W., on left bank at Puller Hot Springs, a quarter of a mile upstream from Cottonwood Creek, 6 miles upstream from Ruby Dam, and 10 miles south of Alder. Datum of gage is 5,440.2 ft above mean sea level (river-profile survey).

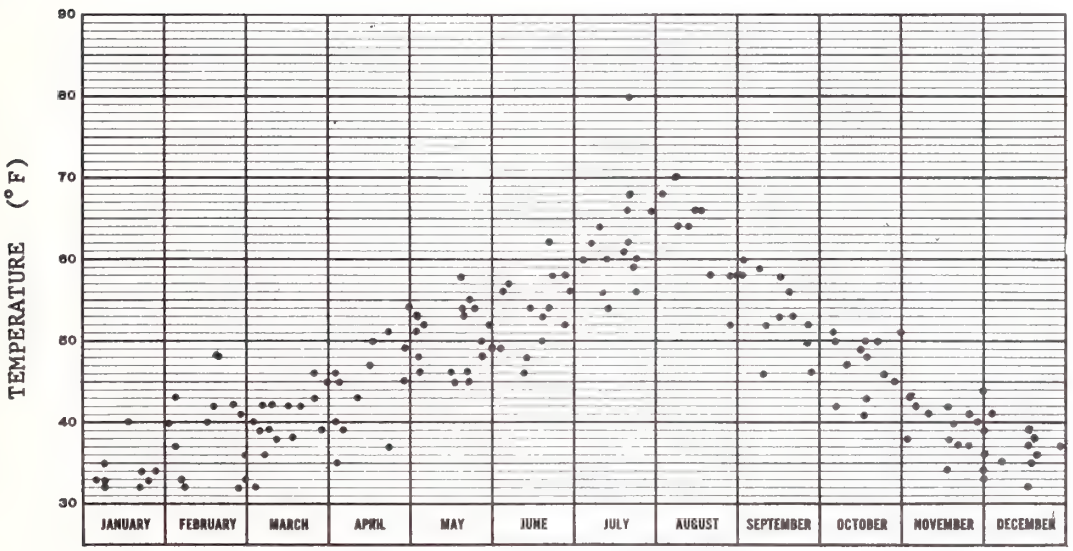
Drainage area.--538 sq mi.

Water temperature records available.--160 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1938-65: Maximum, 1,340 cfs June 8, 1964; minimum daily, 35 cfs Jan. 23, 1962.

Water temperatures 1949-65: Maximum observed, 80°F July 22, 1962; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures show effect of thermal springs on this and tributary streams.



Spot observations of water temperatures, 1949-65

28. Ruby River above reservoir, near Alder, Mont. (6-0195)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
9-51	1300	35	14-51	1425	40	8-50	1130	39	14-49	1430	47	13-52	1250	46	20-50	1200	54
5-52	1330	33	1-52	1500	40	14-51	1100	38	10-51	1500	43	21-53	1900	46	26-51	1400	52
20-54	1430	32	29-52	1030	36	24-53	1345	46	1-52	1000	40	1-54	1730	46	13-52	1230	54
28-55	1100	34	25-53	1000	32	5-54	1710	42	28-53	1230	45	26-55	1400	50	17-53	1700	50
9-57	1545	33	8-56	0945	32	8-55	1200	42	2-54	0930	35	2-56	1725	53	11-54	0830	48
15-58	1355	40	6-57	1345	33	6-56	1415	36	4-56	1650	39	19-56	0910	53	17-55	1400	53
20-59	1700	34	18-58	1750	48	12-57	0930	38	15-57	1745	50	21-56	1630	45	5-57	1105	56
20-61	1215	34	24-59	1700	42	18-58	1205	42	23-58	0845	37	16-57	1105	58	27-58	0900	58
26-62	1030	33	4-60	1030	37	24-59	0930	43	28-59	1500	49	23-58	1000	54	11-59	0900	46
8-65	1000	32	16-61	1040	42	5-60	1000	39	20-61	1440	51	26-59	0930	48	23-59	0830	58
			6-64	1230	33	13-61	1040	42	1-64	0820	46	14-60	1700	45	5-60	1250	57
			28-64	0900	33	1-62	1200	32	2-65	1430	45	21-61	1005	55	1-61	1700	49
			5-65	1230	43	29-62	1000	39	30-65	1445	54	3-62	1200	52	21-61	0925	62
			27-65	0915	41	1-63	0930	40				31-62	0730	49	29-62	0800	56
						28-63	0830	45				1-63	1500	51			
												20-63	1600	54			
												2-64	1300	48			
												30-65	0945	52			
July			August			September			October			November			December		
20-50	1300	59	31-49	1100	58	26-50	1200	52	26-51	1500	46	2-49	1230	38	6-50	1310	35
19-51	1230	66	16-50	1630	66	26-51	1230	50	14-52	1200	41	30-49	1400	36	19-52	0945	36
18-52	1150	61	8-52	1540	70	9-52	1125	46	6-53	0930	42	2-50	1200	43	17-53	0850	37
8-53	1400	64	8-56	1415	64	1-53	1100	60	6-55	1530	50	28-51	1200	40	18-57	0945	35
12-54	1030	60	14-57	1945	66	11-54	0830	52	16-56	0930	43	19-52	1330	40	18-58	1630	38
20-55	0900	62	20-58	0900	58	7-55	1300	59	15-57	1615	50	17-53	0945	42	16-60	1000	32
12-56	1945	54	29-59	1000	58	19-56	1600	53	15-58	1800	48	9-54	1500	41	17-61	1025	39
10-57	1915	56	11-60	1050	64	13-57	1800	58	9-59	1500	47	25-55	1230	41	31-63	1100	37
23-58	0800	60	1-63	1530	68	17-60	1010	56	13-61	0850	49	30-56	0930	34	4-64	1300	41
30-59	1330	66	29-64	1430	52	14-63	0915	53	4-62	0830	51	17-57	1615	38			
7-60	1000	62				29-65	0930	46	31-62	1500	51	30-59	1430	44			
22-62	1600	80							19-63	1000	50	19-60	1000	37			
2-63	1430	60							11-64	1000	47	16-61	0925	34			
21-64	1600	68							28-65	0930	45	30-62	1330	39			
23-65	0730	56										23-63	0800	37			
												6-64	0930	42			
												30-65	0950	33			

29. Ruby River near Alder, Mont. (6-0210)

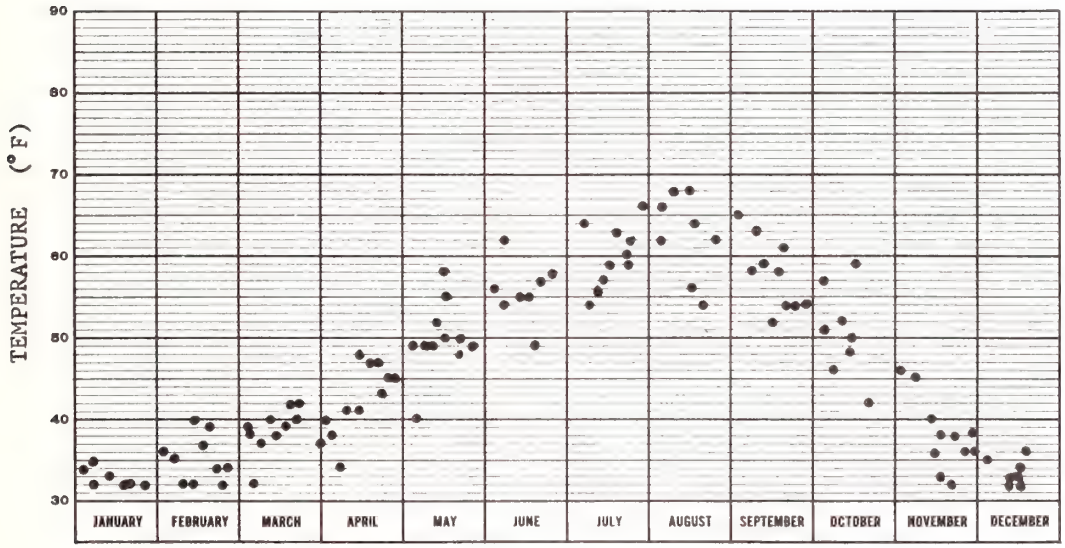
Location.--At gaging station, lat 45°17'30", long 112°06'00", in NW¼NE¼ sec.28, T.6 S., R.4 W., on left bank 200 ft upstream from highway bridge, 2½ miles south of Alder, 3 miles downstream from Ruby River Reservoir, and 6 miles upstream from Alder Creek. Altitude of gage is 5,190 ft (from topographic map).

Drainage area.--614 sq mi.

Water temperature records available.--113 spot observations made at time of discharge measurements during period April 1949 to April 1961.

Extremes.--Discharge 1929-39, 1946-61: Maximum, 1,380 cfs June 11, 1947; minimum daily, 0.3 cfs Apr. 12, 1938.

Water temperature 1949-61: Maximum observed, 68°F Aug. 14, 1957, Aug. 11, 1960; minimum, freezing point on many days each winter.



Spot observations of water temperatures, 1949-61

29. Ruby River near Alder, Mont. (6-0210)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
9-51	1500	35	14-51	1640	40	7-50	1330	37	13-49	1830	41	16-50	1505	55	12-52	1630	55
5-52	1530	34	1-52	1600	36	14-51	1400	39	18-50	1400	47	13-52	1445	49	11-54	1200	55
20-54	1220	32	29-52	1130	34	24-53	1540	40	1-52	1130	40	1-54	1540	49	17-55	1600	49
27-55	1630	32	25-53	1320	32	5-54	1815	38	28-53	1415	45	26-55	1600	48	4-56	1700	56
9-57	1400	32	8-56	1200	32	8-55	1500	40	2-54	1130	38	3-56	0900	40	5-57	1310	62
15-58	1530	33	6-57	1000	32	31-55	1400	37	5-56	0900	34	30-56	1030	49	27-58	1000	58
20-59	1430	32	18-58	1610	39	6-56	1300	32	15-57	1645	48	16-57	1215	58	23-59	1030	57
20-61	1415	32	24-59	1430	34	12-57	1115	38	23-58	1040	43	26-59	1100	50	5-60	0945	54
			4-60	1230	35	18-58	1420	42	28-59	1230	45	13-60	1140	49			
			16-61	1335	37	24-59	1100	42	9-60	1330	41	14-60	1230	52			
						5-60	1230	39	20-61	1645	47	15-60	1020	50			
July			August			September			October			November			December		
20-50	1400	60	17-50	0850	56	15-49	1800	58	25-51	1000	42	30-49	1000	36	6-50	1545	35
17-52	1605	63	22-51	1730	54	25-50	1400	54	14-52	1415	52	2-50	1500	46	19-52	1200	36
8-53	1900	64	8-52	1840	62	26-51	1100	54	6-53	1435	57	28-51	1400	38	17-53	1010	33
12-54	1300	59	8-56	1620	66	9-52	1315	63	6-55	1400	51	19-52	1605	38	18-54	1030	32
20-55	0700	59	14-57	1440	68	1-53	1400	65	16-56	1130	59	17-53	1100	40	18-57	1145	34
11-56	1845	57	19-58	1900	64	11-54	1005	59	15-57	1400	50	9-54	1400	45	18-58	1500	33
9-57	2015	54	29-59	1330	62	7-55	1600	58	15-58	1630	48	25-55	1400	32	16-60	1255	32
22-58	1900	62	11-60	1235	68	19-56	1430	54	9-59	1700	46	29-56	1645	36			
30-59	1530	66				14-57	0830	52				17-57	1145	36			
10-60	1025	56				17-60	1430	61				30-59	1600	38			
												19-60	1200	33			

30. Ruby River at Laurin, Mont. (6-0215)

Location.--At gaging station, lat 45°21', long 112°07', in SW¼SE¼ sec.32, T.5 S., R.4 W., on right bank 200 ft downstream from highway bridge in Laurin and three-quarters of a mile upstream from Alder Creek. Altitude of gage is 5,045 ft (from topographic map).

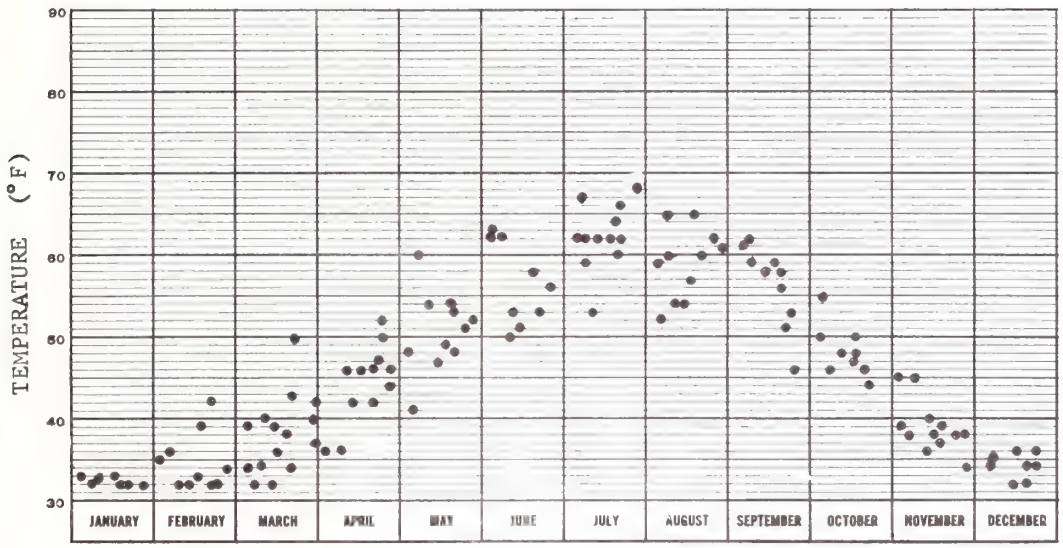
Drainage area.--650 sq mi.

Water temperature records available.--116 spot observations on Ruby River and 14 spot observations on Clear Creek made at time of discharge measurements during period April 1949 to April 1961.

Extremes.--Discharge, 1946-61: Maximum, 980 cfs June 11, 1947; minimum daily, 8 cfs Feb. 26 to Mar. 4, 1961.

Water temperatures 1949-61: Maximum observed, 68°F July 30, 1959; minimum, freezing point on many days each winter.

Remarks.--Clear Creek, which is a secondary channel of Ruby River, begins approximately 3 miles upstream and returns to the river approximately 3 miles downstream.



Spot observations of water temperatures, 1949-61

30. Ruby River at Laurin, Mont. (6-0215)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-51	1130	33	15-51	0930	33	7-50	1100	34	13-49	1800	42	15-50	1610	53	26-51	1630	53
5-52	1700	33	1-52	1730	35	14-51	1530	38	18-50	1530	46	9-51	1700	60	12-52	1430	53
20-54	0940	32	29-52	1230	34	31-52	1300	40	27-53	1800	50	13-52	1615	47	10-54	1920	50
27-55	1500	32	25-53	1450	32	24-53	1640	50	2-54	1230	36	1-54	1405	48	15-55	1030	51
9-57	1730	32	7-56	1645	32	5-54	1615	39	28-55	1300	44	3-56	1055	41	4-56	1545	63
15-58	1435	33	5-57	1730	32	8-55	1600	40	5-56	1015	36	30-56	1120	52	5-57	1525	62
20-59	1130	32	18-58	1500	42	31-55	1230	37	15-57	1455	46	15-57	2000	54	27-58	1100	56
20-61	1545	32	24-59	1200	32	6-56	1100	32	22-58	1815	42	26-59	1300	51	23-59	1130	58
			3-60	1700	36	11-57	1745	36	28-59	1030	46	12-60	1850	54	4-60	1645	62
			16-61	1455	39	18-58	1025	34	9-60	1500	46	14-60	0950	49			
						24-59	1200	43	20-61	1900	47	15-60	0930	48			
						10-60	1000	32									
						Clear Creek											
						7-50	1200	34	18-50	1630	46						
						14-51	1615	39	27-53	1720	52						
						31-52	1415	42									
July			August			September			October			November			December		
20-50	1620	60	17-50	1015	57	15-49	1700	59	24-51	1730	44	2-49	1600	39	7-50	0905	34
19-51	1530	62	9-52	1010	59	25-50	1230	53	13-52	1530	48	2-50	1605	45	19-52	1230	36
17-52	1450	62	31-53	1620	61	26-51	0930	46	6-53	1530	55	28-51	1500	38	17-53	1130	36
9-53	1130	67	13-54	0830	54	8-52	1645	61	6-55	1230	50	19-52	1700	37	18-54	0930	32
11-54	1900	62	9-56	0815	52	11-54	1110	59	15-56	1730	50	17-53	1310	40	18-57	1430	34
20-55	1230	64	15-57	0800	54	19-56	1330	51	15-57	1115	48	9-54	1230	45	19-58	1000	34
12-56	0930	53	19-58	1800	65	13-57	1615	58	15-58	1530	47	30-56	1200	34	16-60	1450	32
9-57	1900	62	29-59	1500	62	17-58	1500	56	9-59	1800	46	17-57	1405	36			
22-58	1800	66	11-60	1430	65	17-60	1800	58				6-59	1400	38			
30-59	1730	68										30-59	1700	38			
10-60	1220	59										18-60	1645	38			
						Clear Creek											
20-50	1700	62	22-51	1030	60	26-51	0835	46	25-51	1100	46	18-52	1700	39	7-50	1000	35
			9-52	1145	60	9-52	1740	62							18-52	1605	36

31. Ruby River near Twin Bridges, Mont. (6-0230)

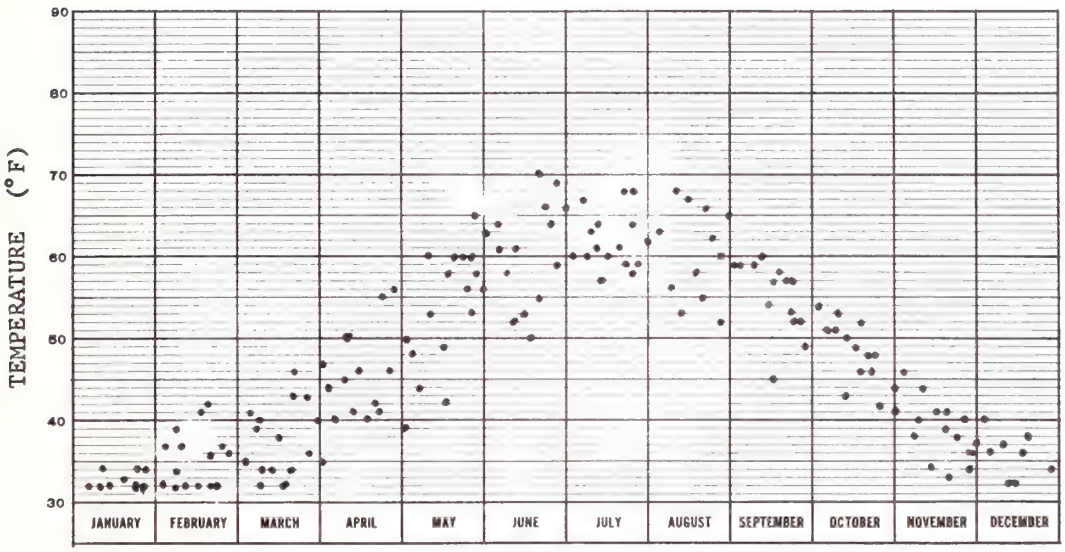
Location.--At gaging station, lat 45°30'30", long 112°19'50", in NE¼NW¼ sec.10, T.4 S., R.6 W., on right bank at upstream side of county bridge, 1¼ miles upstream from mouth, and 2½ miles south of Twin Bridges. Altitude of gage is 4,670 ft (by barometer).

Drainage area.--935 sq mi.

Water temperature records available.--165 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1940-43, 1946-65: Maximum, 1,500 cfs June 12, 1947; minimum daily, 1.8 cfs May 20, 21, 26, 27, 1954.

Water temperatures 1949-65: Maximum observed, 70°F June 21, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

31. Ruby River near Twin Bridges, Mont. (6-0230)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-51	1700	34	2-52	1100	37	6-50	1700	34	13-49	1230	41	15-50	1105	42	12-52	1135	53
27-55	1700	34	29-52	1500	36	12-51	1730	32	18-50	0930	40	12-52	1435	53	10-54	1715	52
9-57	1130	32	24-53	1725	36	23-53	1720	46	27-53	1500	55	26-53	1400	56	15-55	0830	50
16-58	0855	33	8-56	1450	32	5-54	1450	39	1-54	1800	35	1-54	1140	39	4-56	1400	61
20-59	1030	32	5-57	1500	32	7-55	1900	34	5-56	1230	40	3-56	1230	44	6-57	1000	58
20-61	1710	34	18-58	1345	42	31-55	1100	40	15-57	1340	46	30-56	1345	58	27-58	1330	64
25-62	1400	32	24-59	1100	32	6-56	0845	32	22-58	1700	41	16-57	1505	58	10-59	2000	61
7-63	0930	32	5-60	0930	34	11-57	1600	38	28-59	0900	46	26-59	1500	60	22-59	2030	66
8-65	1330	32	16-61	1620	41	18-58	0910	34	9-60	1730	50	12-60	1645	60	4-60	1440	64
			26-62	1430	32	23-59	1800	43	21-61	1000	42	15-60	1130	49	21-61	1315	70
			13-63	1100	32	29-62	1330	36	1-64	1240	47	21-61	1315	60	28-62	1630	68
			28-64	1800	37	3-63	1100	35	2-65	1200	44	31-62	1000	56	17-64	1700	55
			5-65	1700	39	28-63	1200	43	9-65	0950	45	2-63	1100	48	1-65	1500	63
			2-65	0935	32	5-64	1245	40	30-65	1440	56	20-63	1930	60	28-65	1500	59
			6-65	0730	37	4-65	1515	41				26-64	1300	53			
												1-65	1700	50			
												30-65	1400	65			
July			August			September			October			November			December		
21-50	1100	59	16-50	0935	55	15-49	1330	58	25-51	1630	42	1-50	1435	41	7-50	1510	36
17-52	1110	60	24-51	1530	62	25-50	1050	52	13-52	1400	46	28-51	1700	40	18-52	1155	36
9-53	0830	60	12-52	1430	67	25-51	1830	52	6-53	1750	53	18-52	1400	39	16-53	1625	37
11-54	1700	61	31-53	1500	65	8-52	1400	59	6-55	1100	51	17-53	1545	41	17-54	1630	32
20-55	1400	61	11-54	1900	53	10-54	1800	60	15-56	1550	48	9-54	1100	44	19-58	1300	38
12-56	1045	57	9-56	1000	56	2-55	0900	59	15-57	0855	48	30-56	1420	36	1-59	1200	37
9-57	1510	67	15-57	1000	58	19-56	1200	53	15-58	1430	46	18-57	0930	33	17-61	1330	32
22-58	1300	68	19-58	1700	66	13-57	1400	45	10-59	1030	43	6-59	1530	38	30-63	1700	34
31-59	1000	62	29-59	1700	60	17-58	1400	57	12-61	1500	49	18-60	1505	41	4-64	1530	40
10-60	1520	63	11-60	1820	68	16-60	1810	57	3-62	1600	54	16-61	1130	34			
27-61	0720	59	29-64	1100	52	11-61	1135	54	13-63	1130	52	1-62	1100	44			
23-62	0730	58	3-65	0955	63	13-63	1945	57	10-64	0800	50	30-62	1100	36			
2-63	1100	60				2-65	1220	59	5-65	1045	51	23-63	1300	38			
1-64	1625	66				29-65	1500	49				7-64	0830	40			
21-64	1230	68										2-65	1015	46			
11-65	1450	64										30-65	1140	34			
22-65	1745	64															

32. Big Hole River near Jackson, Mont. (6-0235)

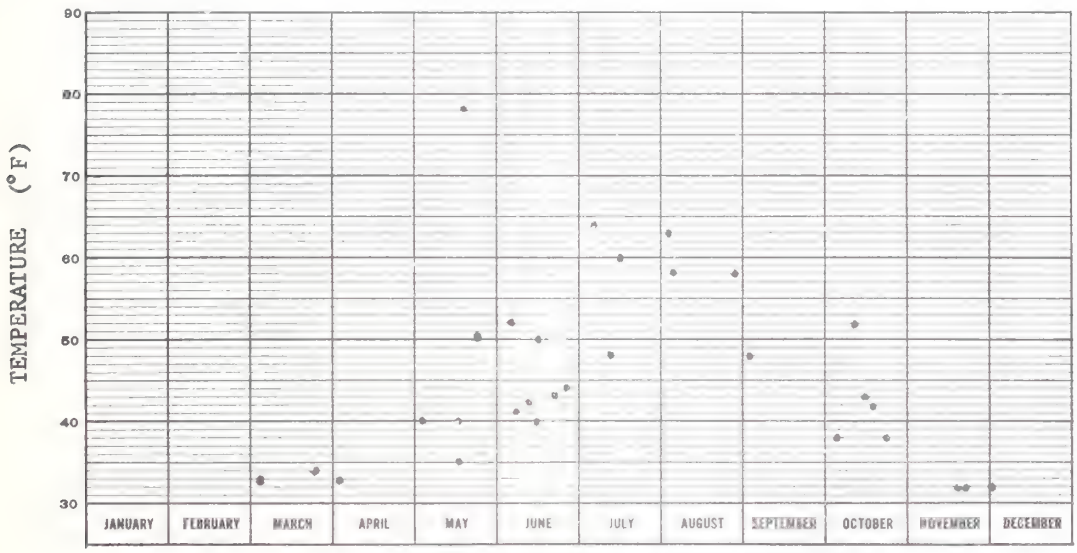
Location.--At gaging station, lat 45°14'20", long 113°27'30", in NW¼NW¼ sec.9, T.7 S., R.15 W., on right bank 1 mile downstream from Pioneer Creek and 9 miles southwest of Jackson. Altitude of gage is 6,970 ft (by barometer).

Drainage area.--44.0 sq mi.

Water temperature record available.--29 spot observations made at time of discharge measurements during period October 1949 to October 1953 (no winter records after 1951).

Extremes.--Discharge 1948-53: Maximum observed, 938 cfs May 29, 1948; minimum daily, 5.0 cfs Feb. 1-3, 1950, Jan. 30, 31, 1951.

Water temperatures 1949-53: Maximum observed, 64°F July 5, 1952; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						3-51	1130	33	2-52	1130	33	19-50	1000	35	14-50	1730	50
						27-53	1100	34				25-50	1900	50	23-50	1300	43
												3-52	1200	40	24-50	0800	44
												19-53	1600	40	6-52	1330	52
															7-53	1230	41
															13-53	1030	42
															14-53	1610	40
July			August			September			October			November			December		
13-50	1915	60	3-50	1200	58	2-51	0930	48	22-49	1700	37	20-51	1430	32	1-49	1200	32
5-52	1600	64	30-50	1400	58				11-50	1830	52	22-52	1440	32			
10-53	0800	48	2-52	1820	63				4-51	1230	38						
									17-52	1530	42						
									15-53	1030	43						

33. Miner Creek near Jackson, Mont. (6-0240)

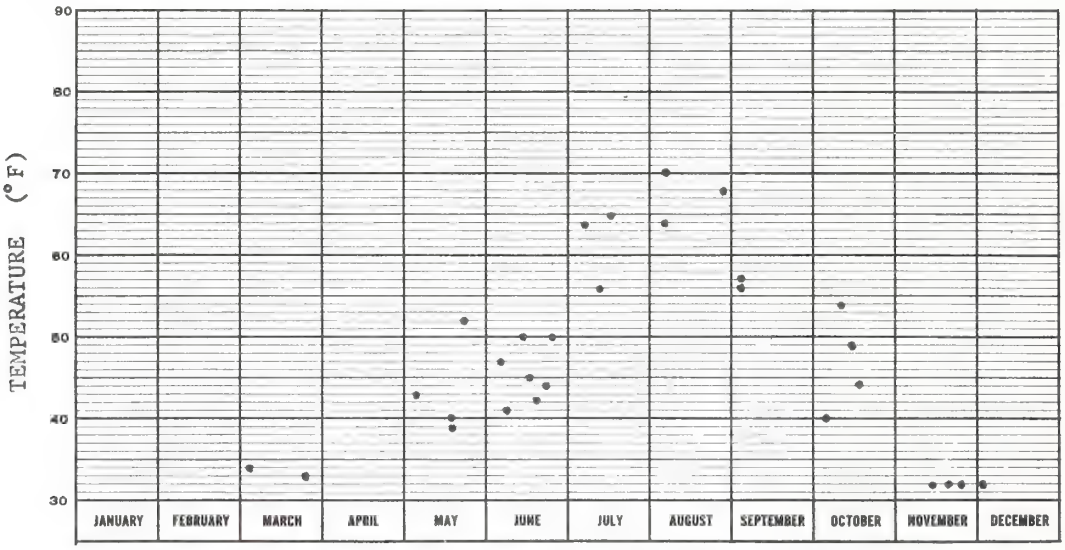
Location.--At gaging station, lat 45°20', long 113°33', in SW¼ sec.3, T.6 S., R.16 W., on right bank 1 mile downstream from Miner Lake, 7 miles southwest of Jackson, and 7½ miles upstream from mouth. Altitude of gage is 6,960 ft (by barometer).

Drainage area.--17.6 sq mi.

Water temperature records available.--29 spot observations made at time of discharge measurements made during period September 1949 to October 1953 (no winter records after 1951).

Extremes.--Discharge 1948-53: Maximum, 336 cfs June 22, 1950; minimum daily, 3.0 cfs Jan. 31 to Feb. 4, 1950.

Water temperatures 1949-53: Maximum observed, 70°F Aug. 3, 1952; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						3-51	1600	34				19-50	1230	39	15-50	1830	42
						27-53	0840	33				25-50	1600	52	23-50	1930	44
												3-52	1500	43	26-50	1200	50
												19-53	1055	40	6-52	1000	47
															7-53	1020	41
															13-53	1300	50
															14-53	1120	45
July			August			September			October			November			December		
13-50	1610	65	3-50	1600	64	2-49	1000	57	11-50	1300	54	15-50	1300	32	1-49	1230	32
6-52	1600	64	30-50	1500	68	2-51	1300	56	4-51	1030	40	20-51	1100	32			
10-53	1345	56	3-52	1410	70				15-52	1630	44	22-52	1635	32			
									14-53	1500	49						

34. Trail Creek near Wisdom, Mont. (6-0245)

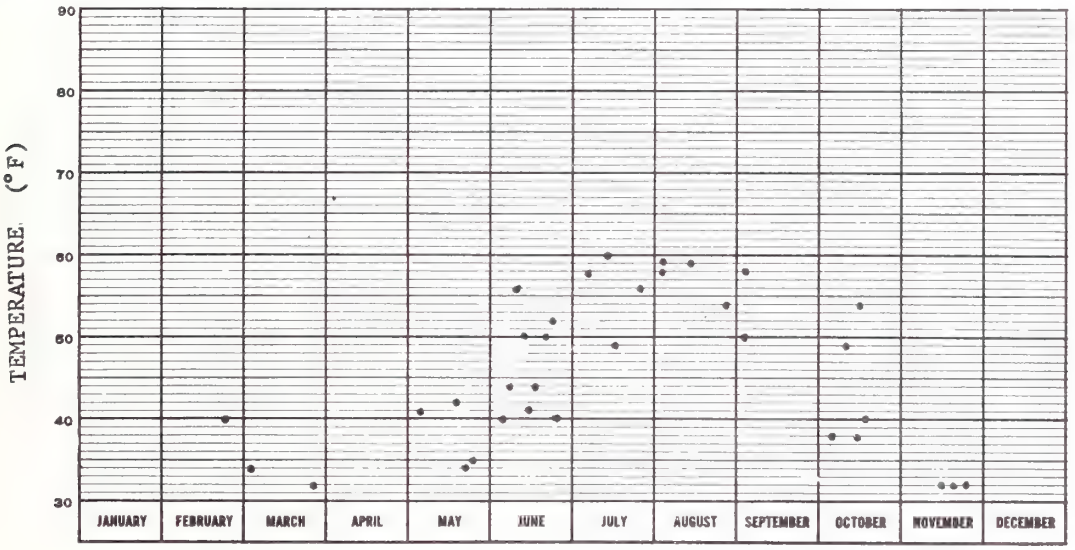
Location.--At gaging station, lat 45°39', long 113°43', in SW¼ sec.16, T.2 S., R.17 W., on left bank 100 ft downstream from Runaway Creek, 4 miles upstream from Ruby Creek, and 13 miles west of Wisdom. Altitude of gage is 6,250 ft (by barometer).

Drainage area.--71.4 sq mi.

Water temperature records available.--34 spot observations made at time of discharge measurements during period June 1949 to October 1953 (no winter records after 1951).

Extremes.--Discharge 1948-53: Maximum, 1,070 cfs June 2, 1953; minimum, 2.2 cfs Nov. 17, 1949.

Water temperatures 1949-53: Maximum observed, 60°F July 10, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures 1949-53

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			26-50	1200	40	1-51	1530	34				20-50	0900	34	10-49	2000	56
						28-53	0850	32				25-50	1100	35	15-50	1400	44
												4-52	0900	41	24-50	1200	40
												18-53	1930	42	7-52	1100	44
															5-53	1450	40
															13-53	1735	50
															14-53	0805	41
															18-53	1500	50
															19-53	0845	52
July			August			September			October			November			December		
13-50	0930	49	3-50	0700	58	2-49	1500	58	14-49	1500	38	15-50	1015	32			
27-51	1000	56	30-50	1100	54	2-51	1700	50	11-50	1600	49	21-51	1030	32			
6-52	1900	58	3-52	1030	59				5-51	1000	38	23-52	1010	32			
10-53	1715	60	13-53	1300	59				16-52	1730	40						
									14-53	0900	54						

35. Big Hole River near Melrose, Mont. (6-0255)

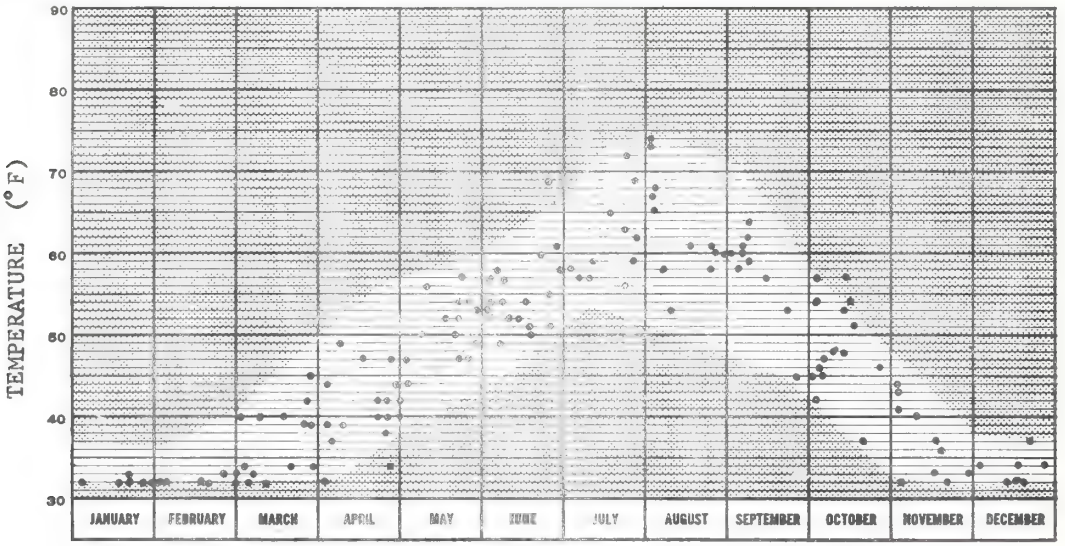
Location.--At gaging station, lat 45°31'25", long 112°42'05", in SE¼SE¼SW¼ sec.34, T.3 S., R.9 W., on left bank at downstream side of bridge on Interstate Highway 15 and U. S. Highway 91, an eighth of a mile downstream from Rock Creek, and 7 miles south of Melrose. Datum of gage is 5,032.87 ft above mean sea level, datum of 1929.

Drainage area.--2,476 sq mi.

Water temperature records available.--156 spot observations made at time of discharge measurements during period September 1949 to December 1965. Once-daily observations made during period August 1956 to September 1957, August 1960 to September 1964 published in reports of the Geological Survey.

Extremes.--Discharge 1923-65: Maximum, 23,000 cfs June 14, 1927, when Wise River Reservoir dam failed; maximum unaffected by dam failure, 14,100 cfs June 3, 1948; minimum observed, 49 cfs Aug. 17, 1931.

Water temperatures 1949-65: Maximum observed, 74°F Aug. 1, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1956-57, 1960-64.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
31-52	1700	32	28-51	1800	33	26-51	1430	42	21-50	1230	40	16-50	1400	52	14-50	1130	52
22-54	1100	32	28-52	1700	32	12-53	1400	40	23-51	1230	42	26-50	1530	54	21-50	1530	60
26-55	1200	32	14-61	1150	32	28-53	1440	45	4-52	1500	44	25-55	1300	47	3-52	1400	57
22-57	1130	33	3-62	1200	32	4-54	1700	32	29-52	1300	44	10-57	1830	50	6-53	1100	52
30-58	1400	32	13-63	1330	32	30-54	1430	34	29-53	0930	40	20-59	1230	47	10-53	0820	52
23-59	1230	32	4-64	1130	32	10-55	1200	32	29-54	0840	42	11-60	1305	56	15-53	0815	54
19-61	1400	32	2-65	1440	32	5-56	1700	32	1-55	1100	32	17-61	1120	50	8-54	1820	52
4-63	1230	32	24-65	1510	33	20-57	0900	34	26-55	1730	39	18-61	1445	54	17-55	0930	50
4-65	1500	32				5-59	1200	34	23-56	1000	42	28-61	1630	49	3-56	1140	54
						17-61	0830	40	25-57	1415	40	2-62	1100	47	26-57	1040	55

35. Big Hole River near Melrose, Mont. (6-0255)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						7-62	0930	33	7-58	1600	49	30-62	1400	53	11-59	1830	57
						26-62	1330	39	8-59	1300	39	2-63	1330	47	1-60	1110	53
						2-63	1330	40	5-60	1100	37	22-63	1700	57	6-61	1345	58
						29-63	1430	39	17-61	1440	47	21-64	0930	52	24-61	1600	69
						3-64	1000	32	3-64	1405	39	2-65	1330	44	7-62	1600	49
						29-65	1515	39	27-64	1725	47	25-65	1415	48	28-62	1430	62
									24-65	0815	38				26-63	0830	51
															11-64	1100	54
															29-64	1700	58
															18-65	0830	51
July			August			September			October			November			December		
12-50	1310	57	29-50	1300	60	14-49	1800	57	20-49	1530	37	6-51	1300	32	17-51	1800	34
23-51	1430	56	27-51	1500	58	23-50	1230	53	13-52	1320	48	17-52	1800	37	15-52	1625	32
1-52	1500	58	11-54	1000	53	26-51	1400	45	13-53	1515	53	20-53	1100	32	14-53	1540	32
28-52	1720	62	7-57	1200	58	8-54	1715	60	6-54	1730	47	11-54	1000	40	16-54	1100	32
7-53	0800	57	4-58	1200	65	1-55	1300	60	5-55	1700	42	21-55	1600	32	15-56	1115	32
9-54	1600	59	25-59	1230	61	4-57	0900	58	17-56	1300	51	2-59	1630	41	19-58	1130	37
22-55	1200	63	3-60	1435	68	10-58	1400	59	1-57	1120	54	15-60	1200	33	13-60	1635	32
27-59	1430	69	18-60	1325	61	13-60	1230	57	13-58	1230	57	15-61	1500	33	14-61	1525	32
24-61	1530	72	1-61	1445	73	6-61	1515	61	6-59	1330	46	1-62	1400	43	27-63	1300	33
25-64	1030	59	2-63	1540	67	8-61	1655	62	9-61	1430	48	29-62	1330	33	1-64	1000	34
19-65	1545	63	25-64	1700	61	9-63	1540	64	1-62	1300	57	18-63	1445	36			
									15-63	1530	54	2-64	1600	44			
									7-64	0800	45						
									1-65	1130	45						
									27-65	1535	46						

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1956	Max	--	--	--	--	--	--	--	67	60	55	41	35
	Min	--	--	--	--	--	--	--	55	44	35	32	32
1957	Max	36	36	40	57	55	66	68	67	67	--	--	--
	Min	32	33	34	38	44	49	55	55	45	--	--	--
1960	Max	--	--	--	--	--	--	--	68	62	54	40	34
	Min	--	--	--	--	--	--	--	52	44	38	32	32
1961	Max	32	36	45	48	59	65	73	74	66	53	45	37
	Min	32	32	33	36	44	50	55	55	45	33	32	32
1962	Max	33	34	41	46	51	63	68	67	60	55	44	34
	Min	32	32	33	32	39	47	54	50	47	41	32	33
1963	Max	34	33	35	--	58	60	68	70	70	56	42	35
	Min	32	32	32	32	44	45	54	55	51	36	33	33
1964	Max	32	32	50	54	52	58	64	67	60	--	--	--
	Min	32	32	32	34	40	48	56	50	47	--	--	--

Extremes for years 1956-57, 1960-64

Max	36	36	50	57	59	66	73	74	70	56	45	37
Min	32	32	32	32	39	45	54	50	44	33	32	32

36. Willow Creek near Glen, Mont. (6-0258)

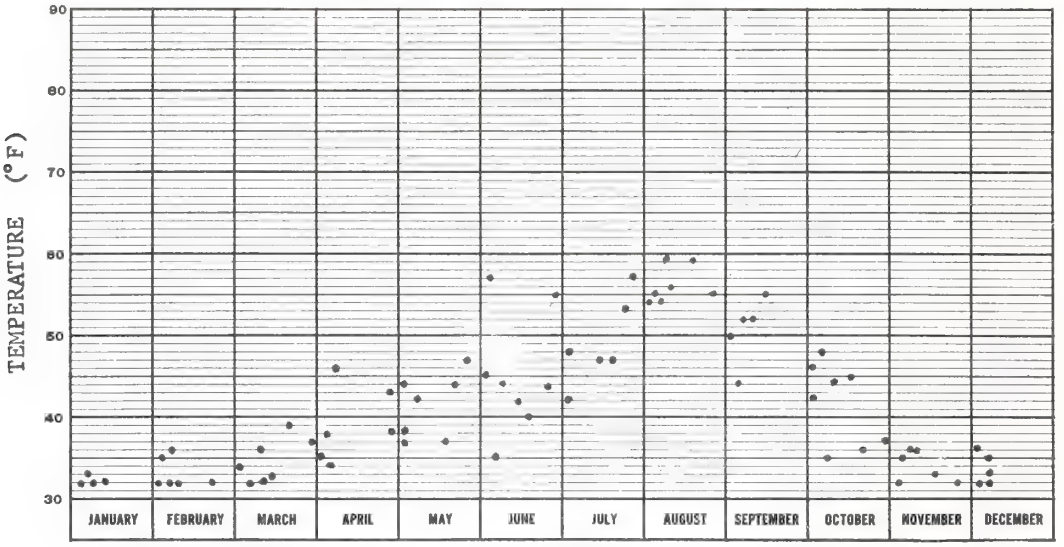
Location.--At gaging station, lat 45°26'50", long 112°49'10", in NE¼ sec.34, T.4 S., R.10 W., on right bank 1 mile downstream from Bond Creek and 7 miles southwest of Glen. Altitude of gage is 6,020 ft (from topographic map).

Drainage area.--35.6 sq mi.

Water temperature records available.--75 spot observations made at time of discharge measurements during period July 1962 to December 1965, including 36 spot observations made at time of sediment sampling during period August 1962 to September 1965 which are published in reports of the Geological Survey.

Extremes.--Discharge 1962-65: Maximum, 310 cfs June 21, 1963; minimum daily, 3 cfs Dec. 17, 1964.

Water temperatures 1962-65: Maximum observed, 59°F Aug. 14, 1962, Aug. 5, 1964; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1962-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-63	1310	32	6-63	1450	36	2-63	1000	32	3-63	1400	38	1-63	0900	38	6-63	0700	35
6-63	1000	32	7-63	0900	32	6-63	0840	33	1-64	0810	35	1-63	1430	44	27-63	0830	44
8-64	1230	32	4-64	1220	35	26-63	1130	39	3-64	0930	34	23-63	0800	37	3-64	1515	57
5-65	1330	33	5-64	1130	32	1-64	1245	34	8-65	1705	46	1-64	1700	37	11-64	1700	44
			2-65	1445	32	4-64	1515	36	30-65	0815	38	7-64	1400	42	18-64	1945	42
			24-65	1015	32	4-65	1115	32	30-65	1140	43	25-64	1530	44	30-64	1510	55
						31-65	1000	37				28-65	1430	52	1-65	1835	45
															19-65	0815	40
July			August			September			October			November			December		
19-62	0835	47	1-62	1610	54	6-62	1230	52	1-62	1630	46	6-62	1400	36	4-62	1510	35
1-63	1155	48	14-62	1310	59	5-63	1150	52	3-62	1605	48	29-62	0930	32	4-62	1535	33
1-64	0545	42	4-63	1330	54	10-63	1640	55	24-62	1500	36	5-63	1430	36	4-63	1205	32
24-64	1700	57	7-63	1100	56	3-64	1120	44	1-63	0925	42	20-63	0745	33	1-64	1315	36
10-65	1020	47	5-64	1450	59	1-65	1255	50	14-63	1530	45	3-64	0830	32	2-65	1505	32
22-65	1245	53	28-64	0830	45				6-64	0720	35	4-64	1300	35			
			3-65	1630	55				7-64	1630	44						
									31-65	1400	42						

37. Birch Creek near Glen, Mont. (6-0260)

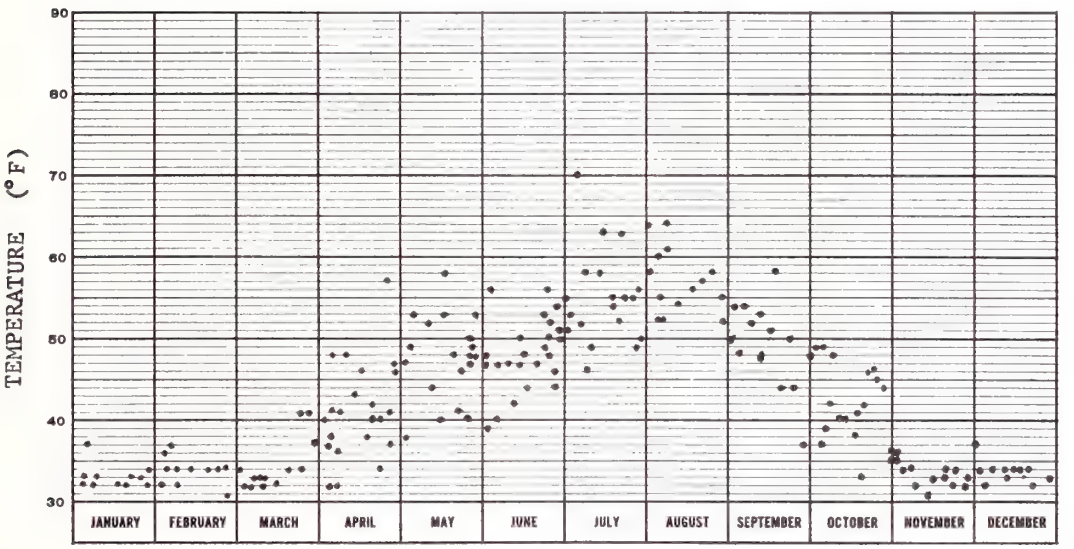
Location.--At gaging station, lat 45°22'45", long 112°47'50", in SE¼SE¼ sec.23, T.5 S., R.10 W., on left bank 2½ miles downstream from Sheep Creek and 8 miles southwest of Glen. Altitude of gage is 5,860 ft (from topographic map).

Drainage area.--36.0 sq mi.

Water temperature records available.--189 spot observations made at time of discharge measurements during periods April 1949 to September 1953 and April 1955 to December 1965, including 27 spot observations made at time of sediment sampling during period August 1960 to June 1962 which are published in reports of the Geological Survey.

Extremes.--Discharge 1946-53, 1955-65: Maximum, 362 cfs June 21, 1963; minimum, 0.8 cfs Nov. 17, 1958.

Water temperatures 1949-53, 1955-65: Maximum observed, 70°F July 6, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1955-65

37. Birch Creek near Glen, Mont. (6-0260)

Water temperatures at time or discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-52	1330	33	26-51	1315	34	12-53	1530	32	15-49	1530	48	26-50	1300	51	14-50	1400	50
22-57	1400	33	28-52	1400	34	28-53	1650	41	21-50	0930	38	21-53	0925	41	27-50	1000	46
30-58	1630	32	7-60	1200	34	18-57	1125	34	23-51	1400	42	25-55	1500	40	27-50	1200	44
7-59	1100	33	2-61	0805	32	5-59	1000	33	4-52	1300	38	18-56	1515	53	30-51	1400	51
23-59	1030	33	14-61	1420	34	1-61	0755	34	29-52	1330	41	11-57	1615	44	3-52	1500	56
4-61	0835	32	3-62	1400	36	6-62	1455	33	29-53	1130	37	27-57	1320	49	10-53	1150	47
19-61	1045	32	28-62	1600	32	6-62	1515	32	5-55	1415	32	26-58	1700	48	11-53	0910	42
4-62	0745	33	7-63	1100	32	6-62	1600	33	26-55	1830	34	7-59	1645	52	15-53	1345	48
31-62	1145	34	4-64	1330	34	26-62	1600	34	23-56	1330	40	20-59	1400	48	14-55	1830	47
6-63	1130	32	4-65	1600	37	2-63	0830	32	29-57	1610	57	3-51	1600	53	25-57	1305	48
5-65	1700	37	24-65	1330	34	26-63	1330	41	7-58	1730	41	18-61	0900	58	2-59	0705	39
						3-64	0900	32	2-59	1625	40	2-62	1600	49	25-59	1130	50
						31-65	1330	37	7-59	1230	36	15-62	0750	40	1-60	1400	48
									5-60	1300	48	28-62	1600	48	1-61	1200	47
									19-60	1830	46	1-63	1200	47	7-61	0620	41
									25-60	1800	40	23-63	1100	46	20-61	0915	49
									4-61	0725	32	1-64	1830	38	24-61	1210	56
									17-61	0730	43	25-64	1700	47	7-62	0815	40
									3-62	1530	41	28-65	1715	53	20-62	1610	53
									30-62	1530	47				30-62	1030	50
									3-64	1300	37				26-63	1800	52
									30-65	1130	46				18-64	1745	44
															30-64	1800	54
															19-65	1100	46
July			August			September			October			November			December		
12-50	1100	49	30-49	1130	52	26-51	1530	44	13-49	1200	33	20-49	1530	33	20-51	1100	32
23-51	1700	52	1-50	1400	58	14-53	1520	58	31-50	1730	35	6-51	1500	32	17-52	1500	33
1-52	1630	55	29-50	1400	58	1-55	1000	50	13-52	1630	42	22-52	1040	34	14-56	1720	33
28-52	2020	56	10-53	1830	54	24-56	1410	50	8-53	0900	40	21-55	1730	32	4-58	0845	32
7-53	1150	52	22-56	1300	56	4-57	1030	48	5-55	1430	39	5-58	1850	34	19-58	0900	34
22-55	0830	54	5-57	1600	64	10-58	1530	53	17-56	1540	45	1-60	0820	36	14-60	0920	34
3-56	1540	53	4-58	1430	60	23-58	1730	44	1-57	1300	48	15-60	1440	33	5-61	1525	34
13-57	1530	58	4-59	1020	52	3-59	1755	54	3-58	1700	49	30-60	1600	33	16-61	1315	34
1-58	1300	51	25-59	1500	57	13-60	1620	51	15-58	1200	46	1-61	0750	35	29-63	1130	33
7-59	0810	46	4-60	0840	52	5-61	1800	54	6-59	1530	42	13-61	1600	32	1-64	1440	37
29-59	0930	48	5-60	1640	61	6-61	1830	52	11-60	1030	38	29-62	1130	32	2-65	1135	34
6-60	1450	70	30-60	1545	55	10-63	0800	48	4-61	0710	37	20-63	1020	34			
7-61	1210	58	1-61	1745	64	30-65	1030	37	9-61	1730	40	3-64	1215	34			
17-61	1820	63	4-63	0730	50				12-61	1125	41						
24-61	1815	63							3-62	1230	49						
26-62	1500	55							29-62	1530	44						
30-62	1015	50							14-63	1200	46						
24-64	1930	55							7-64	1445	48						
22-65	1520	55							31-65	0900	36						

38. Jefferson River near Twin Bridges, Mont. (6-0265)

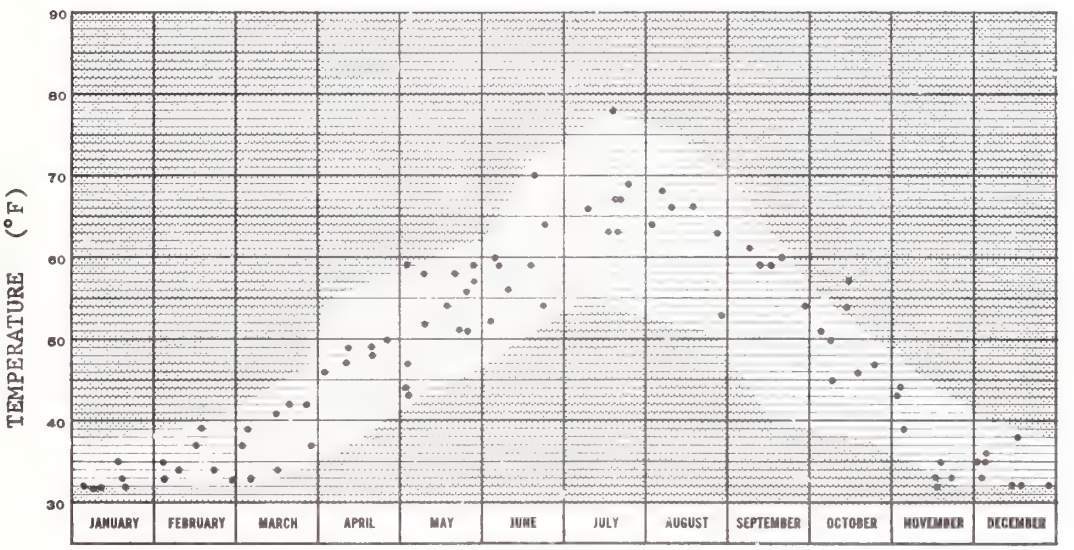
Location.--At gaging station, lat 45°36'50", long 112°19'45", in SE¼SW¼ sec.34, T.2 S., R.6 W., on left bank 250 ft upstream from private bridge, an eighth of a mile upstream from Hell Canyon Creek, 4 miles downstream from confluence of Beaverhead and Big Hole Rivers, and 5 miles north of Twin Bridges. Altitude of gage is 4,560 ft (from topographic map).

Drainage area.--7,632 sq mi.

Water temperature records available.--87 spot observations made at time of discharge measurements during period October 1957 to December 1965. Once-daily observations during periods March 1958 to September 1959 (fragmentary), August 1960 to September 1962, July to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1940-43, 1957-65: Maximum, 16,500 cfs June 10, 1964; minimum, 155 cfs Aug. 19, 20, 1961.

Water temperatures 1957-65: Maximum observed, 78° July 16, 1959; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1957-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1958-59, 1960-62, 1965.

38. Jefferson River near Twin Bridges, Mont. (6-0265)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-58	1400	32	5-58	1230	33	17-58	1615	34	21-58	1605	48	2-58	1330	59	17-58	0730	59
16-58	1335	35	18-58	1110	39	23-59	1530	42	27-59	1730	50	12-58	1100	52	11-59	1400	56
19-59	1600	32	23-59	1700	34	6-62	1400	33	12-60	1600	47	28-58	1200	57	22-59	1230	64
17-61	1800	33	15-61	1645	37	29-62	1530	37	21-61	1400	49	25-59	1730	56	5-60	1900	60
7-63	1130	32	10-63	1300	34	1-63	1330	37	1-64	1415	46	12-60	1255	58	6-61	0900	59
8-65	1600	32	28-64	1345	33	28-63	1400	42	13-65	1615	49	18-61	1915	54	20-61	1645	70
			5-65	0930	35	5-65	1500	39				21-61	1725	58	4-63	1430	52
												2-63	0900	47	24-63	1200	54
												21-63	0800	51			
												2-64	0800	44			
												26-64	1500	51			
												2-65	0800	43			
												29-65	1630	59			
July			August			September			October			November			December		
22-58	1030	63	19-58	1230	66	16-58	1830	59	14-57	1530	54	5-57	1100	39	4-57	1330	35
10-60	1935	66	28-59	1630	63	18-60	1510	60	15-58	1130	46	18-57	1155	32	19-57	1010	32
26-61	1605	69	5-60	1200	68	10-61	1620	61	10-59	1430	45	19-60	1630	35	19-58	1600	38
22-62	1230	67	9-60	1250	66	13-63	1400	59	4-62	1200	51	16-61	1505	33	1-59	1500	35
21-64	0815	67	1-63	1125	64	29-65	1100	44	13-63	1610	57	1-62	0830	43	16-60	1700	32
19-65	1200	63	30-64	0900	53				11-64	1400	50	22-63	1500	33	1-62	1230	35
									25-65	1700	47	6-64	1415	44	30-63	1330	32
															5-64	1015	33
															7-65	1230	36

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1958	Max	--	--	46	52	61	64	65	65	60	53	--	--
	Min	--	--	32	37	48	53	55	51	43	37	--	--
1959	Max	--	--	--	--	62	72	78	73	--	--	--	--
	Min	--	--	--	--	--	55	55	61	--	--	--	--
1960	Max	--	--	--	--	--	--	--	75	68	--	45	38
	Min	--	--	--	--	--	--	--	59	40	37	32	32
1961	Max	37	40	46	55	61	--	75	71	65	55	43	39
	Min	32	32	32	36	43	53	62	60	48	39	33	32
1962	Max	33	36	40	54	57	63	70	69	59	--	--	--
	Min	32	32	32	40	46	48	56	53	49	--	--	--
1965	Max	--	--	--	--	--	--	74	68	56	52	47	40
	Min	--	--	--	--	--	--	--	58	40	44	34	32

Extremes for years 1958-59, 1960-62, 1965

Max	37	40	46	55	62	72	78	75	68	55	47	40
Min	32	32	32	36	43	48	55	51	40	37	32	32

39. Jefferson River near Silverstar, Mont. (6-0270)

Location.--At gaging station, lat 45°39', long 112°18', in SW¼ sec.23, T.2 S., R.6 W., at highway bridge half a mile west of Ironrod, 4 miles southwest of Silverstar, and 7 miles downstream from confluence of Beaverhead and Big Hole Rivers. Altitude of gage is 4,550 ft (by barometer).

Drainage area.--7,683 sq mi.

Water temperature records available.--Thermograph record during period May to November 1963 published in this report.

Extremes.--Discharge 1910-16, 1920-39: Maximum, 20,300 cfs June 15, 1927, when Wise River Reservoir dam failed; minimum observed, 50 cfs Sept. 4, 1937.

Water temperatures 1963: Maximum, 74°F Aug. 9-11, 1963; minimum, 34°F several days in November 1963.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.

Water temperatures (°F), May to November 1963

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	60	61	58	58	60	59	61	62	60	62	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54	56	53	53	54	54	55	56	56	--
June																																
Maximum.....	59	57	56	54	55	56	56	57	54	53	56	61	64	60	--	--	--	--	--	--	--	--	--	--	--	62	63	63	59	60	-	--
Minimum.....	54	54	53	52	50	52	53	53	53	51	51	54	56	59	56	--	--	--	--	--	--	--	--	--	--	--	56	58	57	53	-	--
July																																
Maximum.....	62	66	68	68	68	68	70	70	68	64	64	66	68	64	67	67	65	64	68	70	72	71	72	71	70	66	68	70	70	70	70	68
Minimum.....	53	58	60	61	60	60	60	62	62	60	56	58	59	62	58	59	60	59	58	67	62	63	62	63	60	58	58	60	60	60	60	60
August																																
Maximum.....	71	70	70	71	72	73	73	73	74	74	74	68	72	72	72	69	69	70	69	68	67	64	66	68	66	66	66	68	66	64	60	69
Minimum.....	60	60	60	62	61	62	64	65	64	64	64	64	60	64	62	61	61	60	60	60	58	58	56	58	58	57	57	58	58	58	58	60
September																																
Maximum.....	62	60	62	64	66	66	66	62	65	65	66	65	61	58	55	56	56	58	61	62	61	61	61	60	60	61	61	61	60	60	-	61
Minimum.....	58	58	54	56	58	59	60	62	58	59	58	59	59	55	52	52	53	52	56	57	58	56	57	54	54	54	56	56	54	54	-	56
October																																
Maximum.....	62	60	59	58	58	55	57	56	56	56	56	56	56	56	55	54	53	52	50	52	51	51	50	46	48	46	42	44	44	44	42	52
Minimum.....	54	54	54	54	55	54	52	52	54	52	51	52	52	51	50	49	48	48	50	48	48	48	50	44	45	43	40	40	42	42	40	49
November																																
Maximum.....	42	43	44	44	42	44	42	43	44	43	41	41	43	44	44	41	39	38	38	39	36	35	37	38	37	38	39	36	36	35	-	44
Minimum.....	39	40	41	43	41	41	40	41	42	41	40	39	40	42	43	40	38	37	36	38	35	34	35	36	35	36	37	34	34	34	-	34

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	--	--	--	--	64	72	74	66	62	44	--
	Min	--	--	--	--	62	50	53	56	52	40	34	--

40. Whitetail Creek near Whitehall, Mont. (6-0290)

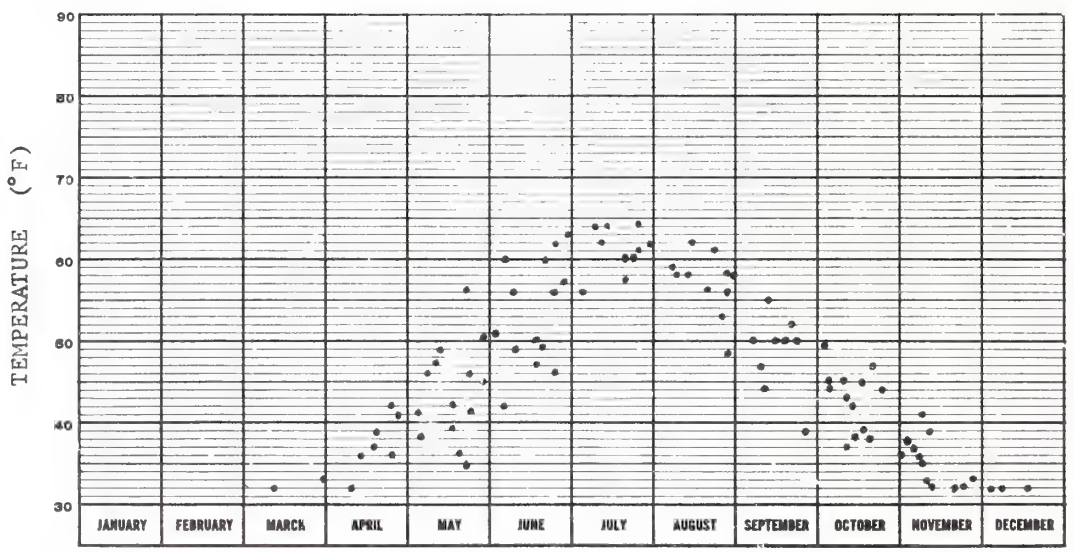
Location.--At gaging station, lat 46°01'22", long 112°12'27", in SE¼ sec.10, T.3 N., R.5 W., on left bank 4 miles downstream from Whitetail Reservoir, 12 miles north of Whitehall, and 13½ miles upstream from mouth. Datum of gage is 5,640.52 ft above mean sea level, datum of 1929.

Drainage area.--30.8 sq mi.

Water temperature records available.--97 spot observations made at time of discharge measurements during periods November 1949 to November 1953, March 1955 to September 1958, August 1959 to December 1965 (no winter records after 1951).

Extremes.--Discharge, 1949-53, 1955-58, 1959-65: Maximum, 126 cfs May 18, 1951; minimum daily, 0.2 cfs Jan. 27-31, 1957.

Water temperatures 1949-53, 1955-58, 1959-65: Maximum observed, 64°F July 9, 1953, July 12, 1956, July 12, 1957, July 24, 1958; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1955-58, 1959-65

40. Whitetail Creek near Whitehall, Mont. (6-0290)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						10-51	1530	32	27-53	1145	41	8-50	1200	38	25-51	1800	46
						31-53	1220	33	22-58	1420	36	23-50	1100	35	5-52	1330	60
									12-60	1010	37	29-50	1545	45	5-53	0810	42
									7-61	1100	32	12-52	1125	47	17-53	1030	50
									23-62	1105	42	26-53	1005	41	17-55	1900	47
									9-64	1230	36	16-57	1745	42	6-57	1415	56
									13-65	1220	39	22-58	1830	56	27-58	1700	62
												10-60	1340	46	6-60	0905	49
												16-61	0845	39	20-61	0915	60
												7-63	1200	41	1-62	1100	51
												24-63	1030	46	30-62	1400	63
												13-64	1445	49	28-63	1130	57
												22-64	0945	36	18-64	0900	49
												29-65	1230	50	21-65	1630	56
July			August			September			October			November			December		
19-50	1255	57	23-50	1510	61	21-50	1420	50	11-51	1330	43	5-49	1300	38	5-50	1445	32
3-52	1500	56	28-51	1130	53	8-52	1120	50	13-52	1130	42	29-49	1400	33	17-53	1600	32
9-53	1800	64	11-52	1730	58	18-56	1330	50	5-53	1610	44	1-50	1135	36	3-56	1525	32
19-55	1900	60	31-53	1200	58	13-57	1020	47	3-55	1730	49	14-51	1500	33			
12-56	1410	64	30-55	1730	56	16-58	1530	50	15-56	1300	39	23-52	1640	32			
12-56	1530	64	9-56	1400	58	19-60	1115	52	18-57	0900	38	16-53	1600	39			
12-57	1330	64	15-57	1800	62	14-61	1140	44	14-58	1600	38	10-55	1130	41			
24-58	1730	64	22-58	1000	56	14-63	1530	55	11-59	1300	37	18-57	1650	32			
11-60	1330	62	30-59	1300	58	28-65	1630	39	14-61	1200	45	21-60	1100	32			
31-63	1400	62	8-60	1745	59				5-62	1030	45	6-62	1130	37			
20-64	2110	60	30-64	1330	49				19-63	1430	47	20-63	1400	33			
23-65	1500	61							10-64	1630	45	9-64	1315	36			
									25-65	1330	44						

MISSOURI RIVER MAIN STEM

41. Jefferson River at Cardwell, Mont.

Location.--At thermograph site, lat 45°51'20", long 111°57'10", in SE¼NE¼ sec.10, T.1 N., R.3 W., under bridge on county road, half a mile south of Cardwell. Altitude is 4,260 ft (from topographic map).

Water temperature records available.--Thermograph records during period May to July 1963 published in this report.

Extremes.--Water temperatures 1963: Maximum recorded, 77°F July 22; minimum, 53°F June 5.

Cooperation.--Thermograph record furnished by Montana and Fish and Game Department.

Water temperatures (°F), May to July 1963

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	65	64	64	64	64	64	66	66	66	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	62	61	59	58	59	58	59	61	60	--
June																																
Maximum.....	62	62	59	57	58	58	59	58	56	55	60	62	66	64	63	65	66	68	68	68	64	60	58	58	60	64	--	--	--	--	-	--
Minimum.....	60	58	57	56	53	56	57	56	55	54	54	57	60	62	60	59	62	63	65	64	57	56	56	56	54	--	--	--	--	--	-	--
July																																
Maximum.....	--	--	72	74	73	73	74	75	73	69	65	68	72	68	70	72	70	68	72	74	76	77	76	76	72	67	72	73	73	74	--	--
Minimum.....	--	--	--	65	66	65	66	66	67	64	61	61	62	65	62	62	64	63	62	65	67	68	68	68	66	63	62	64	64	64	--	--

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	--	--	--	66	68	77	--	--	--	--	--
	Min	--	--	--	--	--	53	62	--	--	--	--	--

42. Boulder River above Rock Creek, near Basin, Mont. (6-0305)

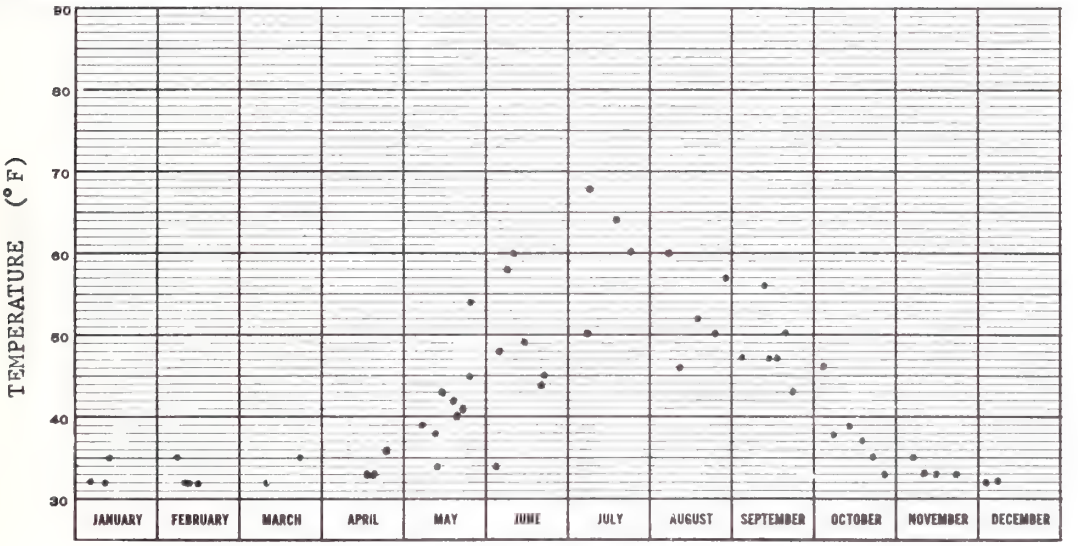
Location.--At gaging station, lat 46°15'10", long 112°30'10", in SW¼ sec.20, T.6 N., R.7 W., on left bank half a mile upstream from Rock Creek, 2 miles upstream from Thunderbolt Creek, and 12 miles west of Basin. Altitude of gage is 6,260 ft (from topographic map).

Drainage area.--19.4 sq mi.

Water temperature records available.--55 spot observations made at time of discharge measurements during periods September 1949 to November 1953, May 1955 to October 1957.

Extremes.--Discharge 1936, 1946-53, 1955-57: Maximum, 582 cfs May 19, 1948; minimum daily, 0.5 cfs Jan. 28, 29, 1951, Mar. 23, 1953.

Water temperatures 1949-53, 1955-57: Maximum observed, 68°F July 6, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1955-57

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
11-51	1100	32	8-50	1100	35	11-51	1400	32	20-50	1030	33	10-50	1035	39	25-51	1430	45
4-52	1700	32	12-51	1725	32	26-53	1245	35	21-50	1200	33	17-50	1000	34	24-52	1130	44
12-53	1210	35	14-52	1700	32				23-53	1530	36	29-50	1005	40	3-53	1500	34
			12-53	1300	32							23-52	1030	42	4-53	1630	48
												25-53	1805	41	14-55	1040	49
												24-55	1500	40	12-56	1525	60
												18-56	0930	43	11-57	1450	58
												28-56	1800	54			
												17-57	0915	38			
25-52	1255	60	22-50	1125	52	14-49	1400	56	27-50	1230	33	9-49	1130	33	2-52	1430	32
6-53	1610	68	27-51	1700	50	22-50	1040	43	8-52	1010	38	6-50	1730	35	4-56	1110	32
19-55	1400	64	30-55	1400	57	3-52	0945	47	13-53	1000	39	10-52	1250	33			
6-56	0900	50	10-56	0800	46	17-53	1020	47	3-55	1400	46	20-53	1525	32			
			6-57	1630	60	18-56	1600	50	22-56	1500	35						
						16-57	1145	47	18-57	1630	37						

43. Boulder River near Boulder, Mont. (6-0330)

Location.--At gaging station, lat 46°12'40", long 112°05'25", in NE¼SW¼ sec.3, T.5 N., R.4 W., on left bank at downstream side of highway bridge, three-quarters of a mile downstream from Muskrat Creek and 2 miles southeast of Boulder. Altitude of gage is 4,810 ft (by barometer).

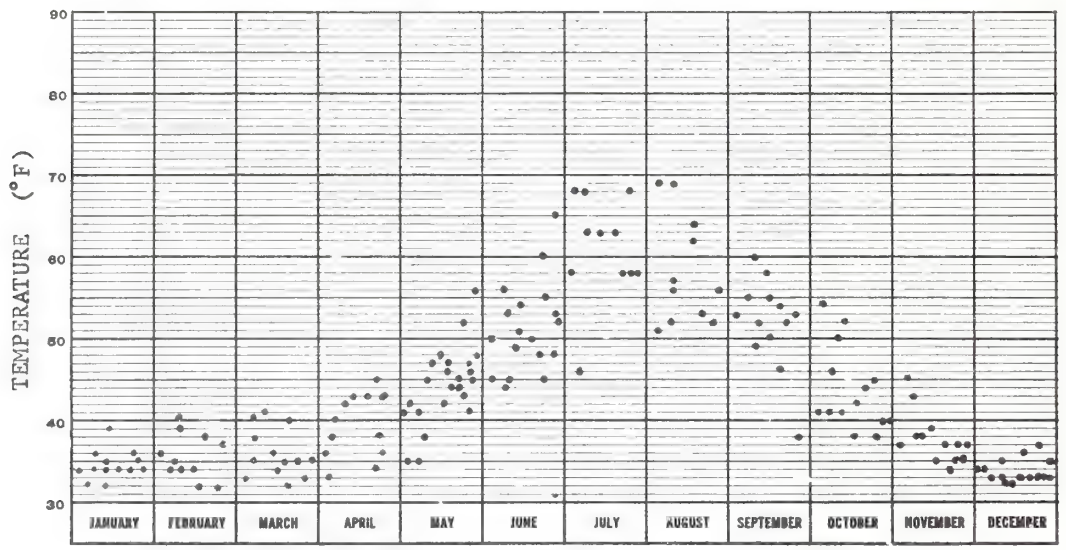
Drainage area.--381 sq mi.

Water temperature records available.--168 spot observations made at time of discharge measurements during period September 1949 to December 1965.

Extremes.--Discharge 1929-32, 1934-65: Maximum, 3,490 cfs June 9, 1964; no flow July 15-17, 21, 1931.

Water temperatures 1949-65: Maximum observed, 69°F Aug. 18, 1960, Aug. 6, 1963; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures affected by springs in this and tributary streams.



Spot observations of water temperatures, 1949-65

43. Boulder River near Boulder, Mont. (6-0330)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
11-51	1400	35	8-50	1400	40	15-50	1300	35	20-50	1300	45	10-50	1300	47	25-51	1200	45
5-52	1030	32	12-51	1410	34	12-51	1300	34	23-53	1900	38	17-50	1325	46	24-52	1500	48
12-53	1600	39	2-52	1630	36	28-52	1330	33	2-54	1700	36	29-50	1245	48	3-53	1800	50
19-54	1230	34	29-52	1700	37	21-53	0900	40	9-55	1430	43	23-52	1500	52	4-53	1325	45
25-55	1100	36	17-58	1425	38	6-54	1235	38	17-57	1615	43	25-53	1435	47	11-54	1525	51
8-57	1215	34	23-59	1200	32	7-55	1530	41	29-58	0940	36	2-54	1145	41	9-55	1600	49
29-57	1705	34	8-60	1730	34	11-57	1315	36	27-59	1300	43	24-55	1100	41	11-57	1045	54
23-59	1100	34	13-61	1030	32	17-58	1040	32	4-60	1030	38	29-56	1130	56	28-58	1100	53
11-60	1035	32	8-63	1330	38	23-59	1100	35	7-61	1500	42	17-57	1345	47	25-59	0930	55
26-62	1430	35	7-64	1700	35	6-62	1000	35	3-63	0930	33	7-58	1350	41	7-60	1725	56
8-63	1400	36	26-64	0930	32	4-63	1000	33	4-65	1400	40	16-58	0930	42	25-61	1010	60
2-64	1715	34	6-65	1015	34	30-64	0900	35	22-65	0930	34	25-59	1230	46	8-62	1200	53
11-65	1200	34				6-65	1415	40				9-60	1120	45	29-62	1600	65
												15-60	1530	48	8-64	1745	45
												22-61	0840	43	16-64	1130	50
												8-62	0930	43	29-64	0900	52
												3-63	1300	42	7-65	1000	44
												20-63	1100	45	28-65	1000	48
												27-63	0930	45			
												3-64	1145	35			
												19-64	1100	44			
												7-65	0830	35			
												20-65	1235	44			
July			August			September			October			November			December		
25-52	1835	68	22-50	1435	64	14-49	1200	58	31-50	1200	38	9-49	1330	38	6-50	1500	32
6-53	1310	68	27-51	1330	52	22-50	1300	53	19-51	1500	44	29-51	1600	37	3-52	1030	34
12-54	1800	63	10-53	1115	57	3-52	1130	53	8-52	1200	46	10-52	1605	39	14-53	1130	36
6-56	1100	46	9-54	1730	52	17-53	1220	54	13-53	0755	41	20-53	1710	35	20-54	1200	33
9-57	1200	63	30-55	1200	56	11-54	1540	60	9-54	1300	50	4-54	1300	45	4-56	1400	33
25-58	1030	58	10-56	1300	56	18-56	1100	52	22-56	1145	38	21-55	1200	35	19-57	1615	33
5-60	1440	68	22-58	1500	62	16-57	1415	55	21-57	1420	45	19-57	0915	34	22-58	1100	33
24-61	0925	58	5-59	0900	51	16-58	1200	50	14-58	1200	38	2-59	1600	37	5-59	1400	35
3-63	0900	58	18-60	1705	69	8-59	1330	55	3-59	1000	41	14-60	1335	35	12-60	1100	33
20-64	1100	63	6-63	1600	69	12-60	1110	52	13-61	1650	52	17-61	1330	37	30-60	1130	35
27-65	0915	58	25-64	1030	53	11-61	1630	49	4-62	1500	54	6-62	1500	43	20-61	1150	37
						17-63	0900	46	15-63	0830	42	26-63	1415	37	5-62	0930	33
						28-65	1230	38	6-64	1000	41	9-64	1030	38	7-64	1000	32
									29-65	1200	40				21-64	1100	33
															1-65	1220	34

44. Jefferson River at Sappington, Mont. (6-0345)

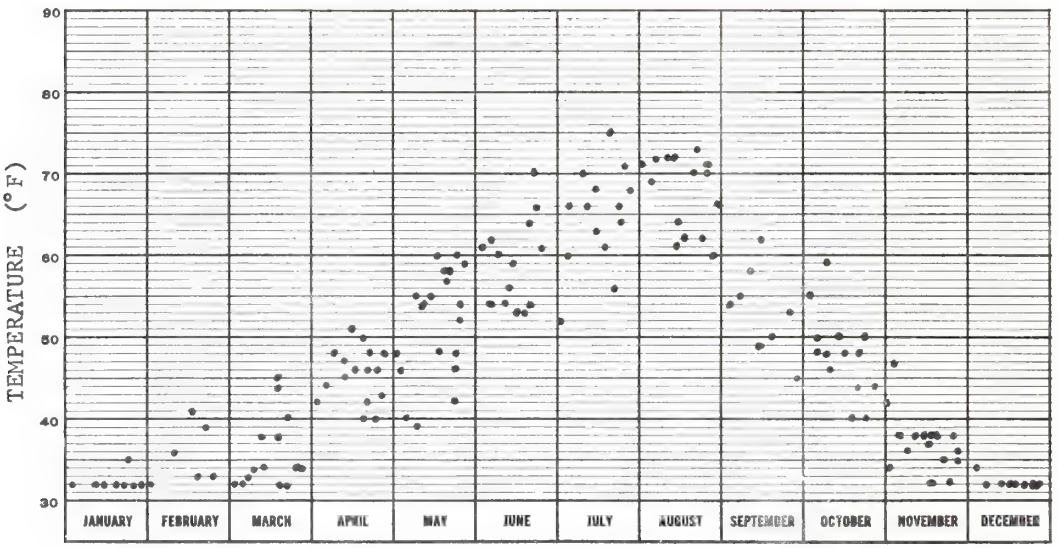
Location.--At gaging station, lat 45°48'15", long 111°45'05", in SE¼ sec.29, T.1 N., R.1 W., on right bank at upstream side of bridge on U. S. Highway 287, 1 mile northeast of Sappington, 5½ miles upstream from Willow Creek, and at mile 18.0. Altitude of gage is 4,170 ft (from topographic map).

Drainage area.--9,277 sq mi.

Water temperature records available.--153 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1895, 1896-1905, 1938-65: Maximum observed, 21,000 cfs June 23, 1899; minimum, 134 cfs Aug. 12, 1940.

Water temperatures 1949-65: Maximum observed, 75°F July 17, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

44. Jefferson River at Sappington, Mont. (6-0345)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
26-53	1300	35	20-58	1455	41	28-49	1600	34	26-49	1630	42	19-49	1500	48	8-49	1330	60
23-56	1630	32	17-61	1105	36	6-50	1400	33	17-50	1600	47	9-50	1230	39	5-53	1600	54
13-58	1330	32	1-62	1400	32	1-53	1245	32	27-53	1300	46	24-50	1200	42	15-53	1500	53
22-59	1800	32	25-63	1515	39	26-53	1430	40	27-54	1200	40	22-51	1130	58	17-55	1045	54
17-61	1420	32	27-64	1000	32	28-54	1800	34	19-55	1015	46	6-52	1155	40	12-57	1030	59
4-64	1000	32	24-65	1500	33	5-56	1200	32	3-56	1245	42	25-53	1330	46	25-58	1130	61
27-64	1500	32				13-57	1530	34	17-57	0915	45	19-54	1200	60	10-59	1300	54
26-65	1100	32				20-58	1220	38	24-58	1050	40	26-55	1030	52	23-59	1630	66
						25-59	1400	44	29-59	1800	48	1-56	1425	48	6-60	1600	62
						12-61	1325	38	11-60	1730	48	25-56	1630	60	19-61	1510	70
						8-62	1030	34	6-61	1320	44	13-57	1320	54	2-62	1530	61
						28-62	1000	34	18-62	1750	51	22-58	1100	58	20-63	1600	64
						25-63	1310	45	28-62	1100	43	26-59	1830	54	11-64	1555	56
						25-64	1500	32	24-63	1600	50	10-60	0955	55	16-65	1230	53
						26-65	1030	32	26-64	1530	46	15-61	1420	55			
									26-65	1500	48	22-63	1300	57			
												30-63	1200	59			
												5-64	1300	46			
												25-65	1130	48			
July			August			September			October			November			December		
6-49	0930	60	15-50	1615	62	21-50	1030	50	24-51	1430	40	1-49	1200	42	7-53	1600	32
19-50	0945	56	29-51	1800	60	29-51	1630	53	10-52	1500	50	16-49	1530	38	27-54	1130	32
1-52	1150	52	5-52	1830	69	5-52	1430	54	5-53	1000	48	28-50	1400	38	12-55	1335	32
6-53	1630	66	13-54	1330	61	11-56	1400	58	14-54	0840	40	29-51	1230	36	16-57	1420	32
11-55	1235	66	22-55	1445	73	18-57	1630	49	3-55	1425	55	7-52	1030	38	16-58	1530	32
9-56	1505	70	6-56	1500	72	19-60	1715	62	18-56	1630	50	10-53	0900	38	17-60	1120	32
12-57	0830	63	12-57	1300	72	8-62	1500	55	17-57	1710	48	18-54	0850	38	4-62	1300	34
24-58	1430	71	21-58	1700	70	30-65	1200	45	17-58	1300	44	2-55	1600	34	29-64	1200	32
12-60	1100	68	1-59	1030	71				12-59	1030	48	26-56	1405	32			
17-61	1610	75	30-59	1730	66				7-61	1700	46	15-57	1220	37			
28-62	1200	68	12-60	1050	72				5-62	1600	50	8-59	1100	36			
22-63	1730	64	26-61	1900	71				7-63	1700	59	21-60	1520	35			
21-64	0800	66	26-63	1700	70				6-64	1045	48	14-61	1100	38			
14-65	1100	61	25-64	0830	62				29-65	0930	44	3-62	1130	47			
			19-65	1630	64							16-64	1730	32			
												29-65	1305	35			

45. Willow Creek near Harrison, Mont. (6-0350)

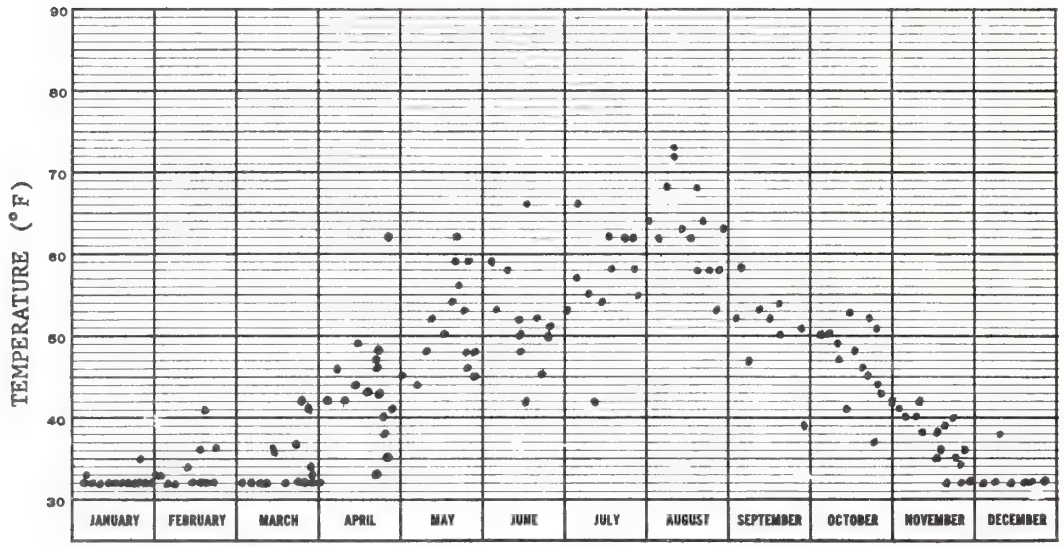
Location.--At gaging station, lat 45°43'20", long 111°44'20", in SW¼NW¼ sec.28, T.1 S., R.1 W., on right bank 1-3/4 miles upstream from Willow Creek Dam, 2½ miles northeast of Harrison, and 11 miles upstream from mouth. Altitude of gage is 4,750 ft (from topographic map).

Drainage area.--83.8 sq mi.

Water temperature records available.--160 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1938-65: Maximum, 813 cfs Feb. 3, 1963; minimum, 1.4 cfs Sept. 17, 1956.

Water temperatures 1949-65: Maximum observed, 73°F Aug. 12, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

45. Willow Creek near Harrison, Mont. (6-0350)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-51	1330	32	1-52	1330	33	28-49	1330	34	26-49	1130	46	23-50	1400	53	3-52	1420	53
4-52	1600	32	27-53	1300	36	26-53	1600	42	17-50	1300	43	22-51	1300	59	16-53	1830	52
4-53	1630	32	4-54	1500	32	3-54	1200	32	30-51	1600	41	6-52	1330	44	16-55	1630	50
26-53	1600	35	6-56	1745	32	28-54	1600	32	27-54	1430	38	25-53	1500	48	19-57	1145	42
31-55	1355	32	25-57	1625	32	2-55	1650	32	27-55	1200	40	19-54	0900	54	24-59	0830	50
11-57	1035	32	20-58	1315	36	31-55	0900	32	3-56	1705	42	26-55	0830	45	6-60	1800	58
29-57	1130	32	25-59	1700	32	7-56	1430	32	16-57	1720	49	1-56	1800	45	19-61	1725	66
13-58	1700	32	17-61	1300	34	20-58	0940	32	24-58	0915	33	28-56	1530	48	2-62	1150	59
22-59	1530	32	1-62	1100	33	25-59	1100	37	29-59	1430	62	13-57	1700	52	24-62	1015	51
17-61	1130	32	25-63	1805	41	12-61	1530	36	11-60	1430	44	22-58	1430	56	23-63	1030	45
4-63	1240	33	26-64	1730	32	7-62	1030	32	6-61	1530	46	9-60	1550	48	22-64	1300	52
28-63	1315	32	24-65	0830	32	29-62	1200	33	28-62	0930	35	15-61	1555	50	16-65	1630	48
4-64	1300	32				28-63	1640	41	26-63	1030	47	26-63	1700	59			
28-64	1030	32				26-64	1000	32	26-64	1800	43	22-64	1255	62			
6-65	1130	32				26-65	1200	32	8-65	1330	44	25-65	1230	46			
26-65	1200	32							26-65	1700	48						
July			August			September			October			November			December		
6-49	1100	57	15-50	1315	63	20-50	1400	54	31-49	1300	42	15-49	1400	39	2-52	1330	32
18-50	1500	58	28-51	1900	58	29-51	1300	51	24-51	1100	44	2-50	1310	41	4-53	1300	32
1-52	1335	53	5-52	2110	62	5-52	1040	58	10-52	1200	48	28-50	1220	35	27-54	1440	32
6-53	1830	66	25-55	1205	64	3-53	1130	52	5-53	1400	50	26-51	1500	36	12-55	1700	32
9-54	1000	55	6-56	1720	68	10-54	1045	53	13-54	1615	45	6-52	1500	40	16-57	1645	32
14-55	0840	54	12-57	1500	72	14-57	1200	52	6-55	1345	47	6-53	1200	42	16-58	1700	32
12-57	1910	42	21-58	1500	68	20-60	1030	50	18-56	1440	51	18-54	1200	40	17-60	1630	32
24-58	1130	62	1-59	1200	64	8-62	1300	46	17-57	1430	52	26-56	1710	32	8-62	1130	38
18-61	1040	62	30-59	1900	63	30-65	0900	39	17-58	1030	37	15-57	1515	36			
28-62	0830	55	12-60	1445	73				11-59	1730	46	8-59	1330	38			
26-63	1800	58	27-61	1040	58				8-61	1135	41	21-60	1650	34			
21-64	1030	62	28-63	0930	53				5-62	1430	50	14-61	1300	38			
			25-64	1200	58				9-63	1330	53	3-62	0900	40			
			19-65	1400	62				6-64	1400	49	20-63	0930	35			
									29-65	1130	43	17-64	1100	32			
												29-65	1440	32			

46. Willow Creek near Willow Creek, Mont. (6-0365)

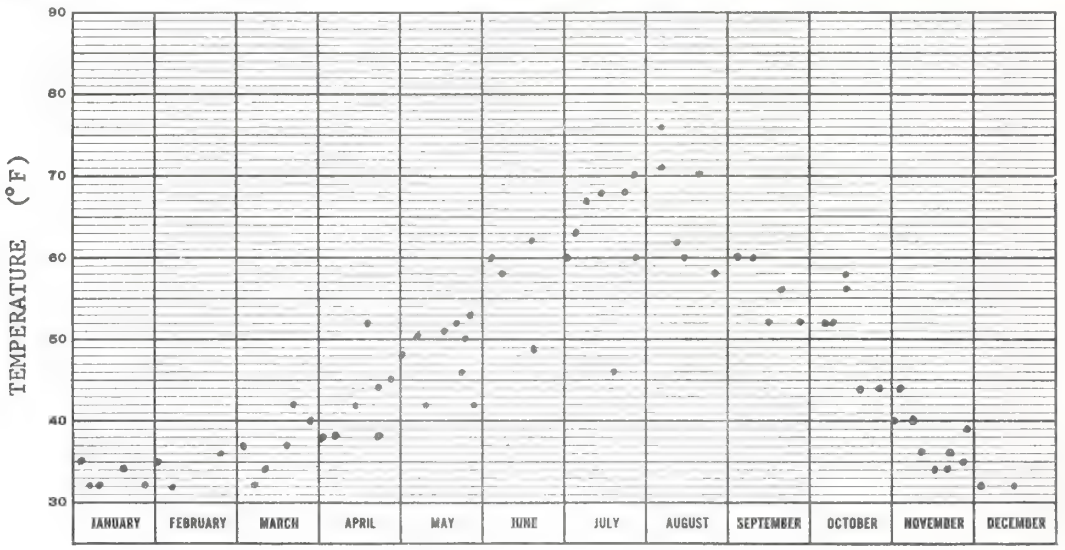
Location.--At gaging station, lat 45°45'00", long 111°39'30", in SW¼NW¼ sec.18, T.1 S., R.1 E., on left bank at upstream side of highway bridge, 4 miles downstream from Willow Creek Reservoir, 5½ miles south of town of Willow Creek, and 6 miles upstream from mouth. Altitude of gage is 4,340 ft (from topographic map).

Drainage area.--165 sq mi.

Water temperature records available.--69 spot observations made at time of discharge measurements during periods March 1949 to November 1953 and March 1955 to October 1956.

Extremes.--Discharge 1919-32, 1946-53, 1955-56: Maximum observed, 650 cfs July 31, 1948; minimum daily, 0.3 cfs Feb. 1, 1951.

Water temperatures 1949-53, 1955-56: Maximum observed, 76°F Aug. 6, 1952; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1955-56

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
2-51	1425	35	1-52	1600	35	2-49	1500	37	1-49	1130	38	18-49	1730	51	7-49	1230	58
30-51	1030	32	27-53	1030	36	3-51	1600	32	26-49	1730	52	9-50	0925	42	3-52	1600	60
4-52	1200	32	6-56	1445	32	25-52	0945	37	17-50	1000	42	24-50	0900	46	17-53	1900	49
5-53	0930	32				26-53	1200	42	30-51	1330	45	22-51	0900	52	17-55	1300	62
26-53	1200	34				30-55	1335	40	27-53	1100	44	6-52	1500	50			
						7-56	1615	34	27-55	0900	38	25-53	1100	50			
									3-56	1045	38	26-55	1430	53			
												1-56	1235	48			
												28-56	1300	42			
July			August			September			October			November			December		
5-49	1600	63	16-49	0900	60	20-50	1110	56	22-51	1200	44	1-49	0930	40	2-52	1530	32
18-50	1045	60	15-50	1045	62	29-51	1000	52	8-52	1445	58	17-49	0900	34	12-55	1140	32
17-51	1330	68	29-51	1030	58	5-52	0910	60	8-53	1600	56	2-50	1630	44			
1-52	1530	60	6-52	1040	76	3-53	0930	60	6-54	1550	52	28-50	0955	35			
6-53	1400	67	25-55	1400	70	14-56	1200	52	6-55	1550	52	26-51	1100	36			
11-55	1535	46	6-56	1250	71				19-56	0910	44	29-51	1500	39			
9-56	1330	68										7-52	0830	36			
												10-53	1100	34			
												5-55	1635	40			

47. Madison River near West Yellowstone, Mont. (6-0375)

Location.--At gaging station, lat 44°39'20", long 111°04'00", in SW¼ sec.36, T.13 S., R.5 E. (unsurveyed), on left bank a quarter of a mile upstream from Riverside ranger station, 1½ miles east of West Yellowstone and west boundary of Yellowstone National Park, 12½ miles downstream from confluence of Firehole and Gibbon Rivers, and at mile 120. Altitude of gage is 6,650 ft (from topographic map). All data from Department of Environmental Studies, Montana State University, at site at Riverside ranger station.

Drainage area.--420 sq mi.

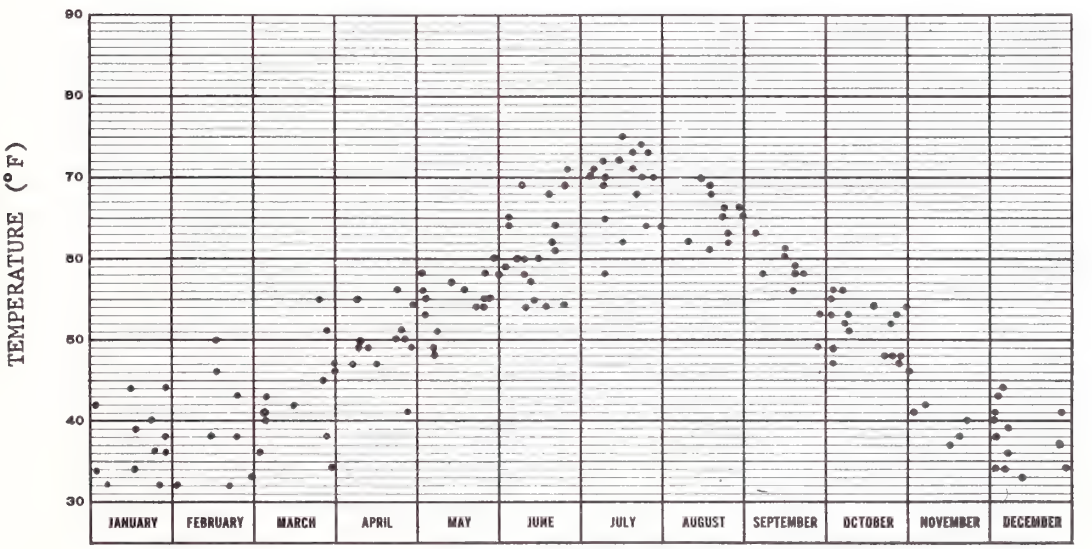
Water temperature records available.--168 spot observations made at time of discharge measurements during period February 1949 to December 1965, including 17 observations made by the Department of Environmental Studies, Montana State University. Thermograph record during periods July to November 1963 and April to October 1964 (incomplete) published in this report. Readings made at 3-hour intervals once a week during period May to October 1965 published in this report.

Extremes.--Discharge 1913-65: Maximum, 2,150 cfs May 24, 1956; minimum, 100 cfs Feb. 7, 1933.

Water temperatures 1949-65: Maximum, 78°F Aug. 5, 1963; minimum observed, 32°F Feb. 1, 1949, Jan. 8, Feb. 20, 1955, Jan. 26, 1957.

Remarks.--Water temperatures show the effect of hot water pools and springs tributary to the Firehole and Gibbon Rivers.

Cooperation.--Seventeen spot observations and thermograph records furnished by Director of Environmental Studies, Montana State University, Bozeman, Mont. Weekly observations obtained from doctoral thesis by Todd (Primary Productivity of the Madison River in Yellowstone National Park, Wyoming, Elston Herbert Todd, Montana State University, Ph.D. thesis, 1967).



Spot observations of water temperatures, 1949-65

47. Madison River near West Yellowstone, Mont. (6-0375)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
22-53	1500	40	1-49	1130	32	14-50	1715	42	23-49	1220	56	16-50	1105	56	7-49	1500	65
15-54	1130	34	16-50	1420	50	3-53	1300	36	24-51	1000	51	9-52	1230	51	24-50	1210	54
8-55	1305	32	14-51	1655	38	25-54	1205	45	13-53	1300	47	6-53	1900	49	10-53	0930	58
13-56	1730	44	17-54	1710	46	31-56	1000	47	29-54	1215	54	25-54	1700	58	12-54	1030	57
26-57	1230	32	20-55	1335	32	5-57	1045	43	7-55	1030	47	1-55	1300	53	14-55	1730	60
23-58	1320	36	23-56	1730	38	4-58	1230	40	29-56	1240	49	30-55	1130	60	20-56	1800	62
14-59	1000	39	27-63	1445	43	24-60	1300	55	12-57	1700	49	24-56	1900	55	13-57	1230	55
29-62	1430	44	28-64	1030	33	31-62	0900	46	10-58	1230	49	3-57	1700	55	3-58	1835	59
3-63	0910	42	25-65	1330	43	5-63	--	41	26-62	0800	50	7-58	1730	48	11-59	1245	60
30-63	1025	36				27-63	1145	51	10-63	--	55	15-59	1105	56	8-60	0800	60
3-64	1100	34				28-64	1000	38	27-63	1330	41	1-60	1030	58	6-61	1430	64
30-64	1030	38				29-65	1000	34	11-64	--	50	3-61	1000	56	10-61	--	69
28-65	1000	36							24-64	0800	50	21-62	1800	54	25-62	1715	71
									28-65	0900	54	31-62	1845	58	26-62	--	69
												24-63	1815	54	17-63	--	68
												13-64	--	57	21-63	1000	61
												26-64	0830	54	10-64	0930	54
												27-65	1600	55	23-64	1330	64
															16-65	1000	54
July			August			September			October			November			December		
6-49	1345	71	23-51	1310	66	15-49	1800	61	30-49	1420	48	15-51	1125	37	13-49	1530	33
31-50	1715	64	12-53	0830	62	15-53	0950	60	2-51	0900	53	2-54	0845	41	5-52	1200	34
28-51	1830	70	25-54	1130	63	22-55	1530	58	20-53	0840	48	8-56	1125	42	3-53	1500	40
10-53	1500	72	18-55	1900	69	29-56	1230	53	2-54	0730	47	22-63	0900	40	2-54	0820	34
14-54	1730	75	23-56	1600	65	18-57	1050	58	28-55	1440	47	19-64	0900	38	2-55	1030	40
16-55	1900	73	18-58	1130	68	18-58	1730	59	25-57	1130	52				6-56	1130	36
24-56	0800	70	22-59	1640	66	7-59	0755	58	27-58	1800	48				7-57	1230	39
11-57	0840	65	26-60	1730	62	18-59	0925	56	3-59	1815	56				3-58	1700	43
10-58	1800	69	31-61	1105	65	6-62	1000	63	6-60	1800	56				2-59	1000	38
8-59	0830	58	15-63	--	70	17-63	--	59	9-61	1705	51				27-61	1530	37
16-60	1030	62	16-63	--	70	28-65	1230	49	31-61	1215	46				6-62	1200	44
19-61	1725	71	29-63	1630	66				3-62	1030	55				6-63	--	36
10-62	--	70	27-64	1500	62				31-62	1600	54				30-64	1030	34
26-62	0900	64	18-65	0800	61				11-63	0900	53				1-65	1330	41
3-63	--	70							16-63	--	54				29-65	0955	41
19-63	--	68							3-64	--	49						
25-63	1430	73							9-64	0930	52						
15-64	--	72							26-65	1300	53						
23-64	1430	74															
12-65	1430	69															

MADISON RIVER BASIN

47. Madison River near West Yellowstone, Mont. (6-0375)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), July to November 1963																																
July																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	74	70	73	73	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	60	62	58	59	--
August																																
Maximum.....	75	74	75	77	78	75	74	76	71	75	76	76	74	74	72	72	74	75	74	71	66	67	66	69	71	70	71	70	71	71	63	72
Minimum.....	62	59	58	63	61	64	67	64	65	66	66	64	64	65	64	61	59	60	59	58	60	60	60	58	56	55	55	57	58	58	61	61
September																																
Maximum.....	64	68	70	72	72	70	68	70	74	73	72	73	62	64	61	63	61	61	67	67	65	65	63	64	67	68	69	68	68	68	-	67
Minimum.....	60	57	57	57	58	60	63	64	62	61	60	60	57	55	55	56	57	59	59	58	60	58	57	55	54	55	56	55	55	55	-	58
October																																
Maximum.....	67	67	63	64	65	63	63	63	61	--	--	--	57	60	62	63	61	57	60	60	55	59	54	51	51	53	53	53	52	50	50	58
Minimum.....	56	54	53	54	54	54	53	52	53	--	--	--	54	53	53	51	48	49	50	52	49	50	50	47	47	47	44	44	47	45	41	50
November																																
Maximum.....	49	49	50	50	47	48	49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	42	--	44	45	43	46	47	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Water temperatures (°F), April to October 1964																																
April																																
Maximum.....	--	--	--	--	--	--	--	--	--	52	46	48	56	58	53	53	57	60	61	55	54	59	56	52	52	54	54	62	65	62	-	--
Minimum.....	--	--	--	--	--	--	--	--	--	46	42	43	45	49	45	41	47	47	51	48	47	49	51	47	46	47	47	50	53	56	-	--
May																																
Maximum.....	58	56	51	50	55	59	61	59	63	60	60	64	64	62	63	64	61	63	61	62	60	59	58	57	59	--	59	58	57	60	60	59
Minimum.....	55	51	47	48	48	51	54	54	54	56	52	53	56	56	54	53	54	52	52	53	51	50	48	49	53	--	54	49	47	52	55	52
June																																
Maximum.....	59	60	60	59	60	59	59	56	58	56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	69	71	71	69	71	71	-	--
Minimum.....	54	54	54	54	57	56	53	52	53	51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	62	64	63	63	62	63	-	--
July																																
Maximum.....	72	73	73	73	70	72	74	75	69	74	76	74	72	73	--	74	75	75	74	75	75	75	75	74	74	74	75	75	74	75	74	74
Minimum.....	62	63	63	63	63	61	62	65	65	62	65	67	66	65	--	65	64	66	65	64	66	65	66	64	63	64	65	65	67	65	66	64
August																																
Maximum.....	72	72	--	--	--	--	--	--	--	--	--	68	69	70	71	71	72	72	--	--	--	--	68	69	--	67	67	61	59	62	67	--
Minimum.....	65	62	--	--	--	--	--	--	--	--	--	63	62	61	61	62	63	63	--	--	--	--	61	61	--	64	62	57	54	54	59	--
September																																
Maximum.....	63	58	63	65	65	66	65	65	64	63	63	64	65	64	66	65	64	62	60	58	61	61	--	--	61	58	59	60	61	58	-	62
Minimum.....	59	55	54	56	57	58	58	57	57	56	55	56	56	57	59	58	57	58	54	55	55	57	--	--	56	52	52	52	55	56	-	56
October																																
Maximum.....	56	56	57	57	58	60	60	59	59	58	58	60	60	58	56	53	51	52	54	56	56	55	54	54	54	54	54	56	57	--	--	56
Minimum.....	52	49	52	50	50	52	54	54	54	54	52	52	54	53	53	49	45	46	47	51	51	52	49	49	49	50	52	52	51	--	--	51

47. Madison River near West Yellowstone, Mont. (6-0375)

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	--	--	--	--	--	--	74	78	74	67	50	--	--
	Min	--	--	--	--	--	--	--	--	55	54	41	--	--	--
1964	Max	--	--	--	65	64	71	76	72	66	60	--	--	--	--
	Min	--	--	--	--	47	51	61	54	52	45	--	--	--	--

Weekly water temperatures (°F) at indicated time, May to October 1965

Date		Hour								
		0600	0900	1200	1500	1800	2100	2400	0300	0600
May	15-16	54	56	61	62	62	59	--	--	55
	22-23	50	51	55	55	55	--	--	--	53
	29-30	57	58	60	62	61	55	50	54	56
June	5-6	54	55	59	61	61	50	54	55	58
	12-13	60	62	64	64	63	61	60	60	58
	18-19	55	57	59	59	60	59	59	58	57
	23-24	62	65	67	--	66	64	62	60	60
	28-29	55	57	60	63	64	62	60	59	59
July	9-10	63	66	70	71	71	68	67	65	64
	14-15	62	65	70	71	70	67	67	--	64
	21-22	64	67	71	70	71	67	66	64	64
	28-29	64	67	73	73	72	70	69	68	67
Aug	4-5	65	68	--	68	68	66	65	64	63
	10-11	67	70	73	75	72	--	68	67	65
	17-18	62	66	70	72	69	66	65	64	62
	24-25	59	62	67	67	65	62	62	--	60
Sept	1-2	56	59	63	64	62	60	59	--	--
	8-9	59	60	--	62	60	59	58	--	58
	15-16	56	56	56	57	55	58	--	--	--
	22-23	51	51	52	53	51	51	50	49	48
Oct	2-3	52	54	58	59	57	54	54	--	53
	9-10	53	54	58	59	56	55	54	54	53
	16-17	50	51	54	55	53	52	--	--	50
	23-24	50	50	54	55	54	51	--	--	50
	29-30	50	50	54	54	52	51	--	--	50

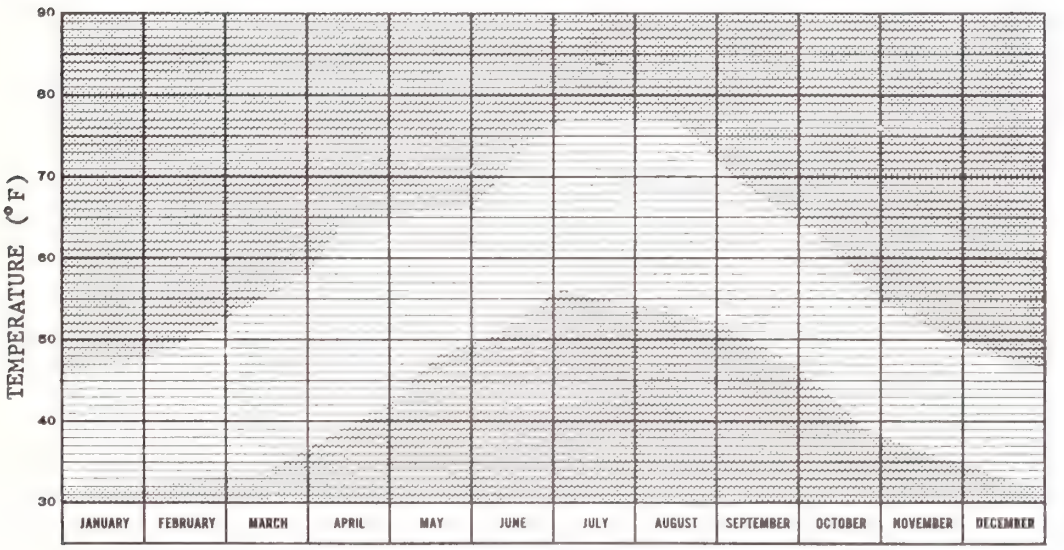
48. Madison River above Hebgen Lake, near West Yellowstone, Mont.

Location.--At thermograph site, lat 44°42'35", long 111°05'55", in SW¼SE¼ sec.10, T.13 S., R.5 E., at old weir just downstream from Yellowstone Park boundary at Montana Fish and Game Department house, 3½ miles north of West Yellowstone. Altitude of gage is 6,550 ft (from topographic map).

Water temperature records available.--Thermograph records during period August 1961 to January 1963 (fragmentary at times) published in this report.

Extremes.--Water temperatures 1961-63: Maximum recorded, 77°F Aug. 19, 1961, July 11, 29, Aug. 15, 1962; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1961-63

48. Madison River above Hebgen Lake, near West Yellowstone, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), August to December 1961																																
August																																
Maximum.....	--	--	--	--	--	--	--	--	70	72	75	75	74	68	76	76	74	75	77	69	76	76	75	73	76	75	72	70	70	70	68	--
Minimum.....	--	--	--	--	--	--	--	--	58	59	59	60	61	60	60	64	61	60	60	62	62	60	63	65	61	64	60	60	60	59	59	--
September																																
Maximum.....	62	57	62	70	70	62	64	70	62	63	--	--	62	64	64	67	65	64	61	56	56	55	55	58	54	58	59	54	52	52	-	61
Minimum.....	56	53	52	53	57	58	55	56	58	57	--	--	51	50	53	57	60	59	55	52	50	50	49	49	48	50	48	50	48	47	-	53
October																																
Maximum.....	58	60	60	60	60	53	54	55	53	52	50	52	58	60	60	60	56	55	55	56	51	46	49	50	49	46	44	46	--	--	--	54
Minimum.....	47	48	48	49	50	50	48	47	42	49	46	48	50	52	52	52	50	43	42	47	44	41	40	40	43	43	38	38	--	--	--	46
November																																
Maximum.....	47	--	--	--	--	--	--	--	--	--	--	--	--	44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	47	44	--	--
Minimum.....	43	--	--	--	--	--	--	--	--	--	--	--	--	42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	44	42	--	--
December																																
Maximum.....	44	46	45	41	41	38	34	37	34	34	34	--	42	41	34	40	40	41	--	--	--	--	--	--	--	--	37	36	40	42	40	--
Minimum.....	41	44	41	37	36	33	34	33	32	32	32	--	38	34	32	34	36	38	--	--	--	--	--	--	--	--	32	34	36	38	38	--
Water temperatures (°F), January to December 1962																																
January																																
Maximum.....	40	--	--	42	40	42	42	42	35	34	33	33	33	33	32	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	46	--
Minimum.....	35	--	--	38	36	37	38	34	34	32	32	32	32	32	32	32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	39	--
February																																
Maximum.....	46	48	46	46	46	45	47	47	48	46	46	47	--	--	--	--	--	--	--	--	--	42	39	38	35	--	--	--	-	-	-	--
Minimum.....	38	39	39	39	38	38	42	43	44	44	44	44	--	--	--	--	--	--	--	--	--	36	35	33	33	--	--	--	-	-	-	--
March																																
Maximum.....	--	37	39	42	47	49	53	--	--	--	--	--	--	46	48	50	51	52	49	51	--	--	52	50	46	55	49	50	52	52	58	--
Minimum.....	--	34	34	34	38	42	45	--	--	--	--	--	--	34	36	37	39	41	43	43	--	--	44	42	43	45	46	42	39	38	43	--
April																																
Maximum.....	58	62	59	54	50	54	53	52	59	--	--	60	62	65	63	63	64	63	65	62	57	60	63	62	57	56	52	49	52	56	-	58
Minimum.....	42	47	46	48	44	44	42	42	44	--	--	44	48	50	52	50	50	52	54	55	50	48	52	54	54	50	49	44	42	45	-	48
May																																
Maximum.....	60	62	62	63	60	57	58	58	58	57	58	54	51	53	52	56	61	61	61	60	58	58	58	58	60	58	56	60	60	63	66	59
Minimum.....	50	52	54	55	54	53	52	53	53	52	52	50	48	48	50	48	51	54	55	54	52	52	52	55	53	54	53	53	55	55	58	53
June																																
Maximum.....	62	66	62	56	54	58	62	67	70	70	68	--	--	--	62	63	66	70	68	69	67	69	72	74	76	75	74	73	73	75	-	67
Minimum.....	58	55	56	52	50	51	50	57	58	60	60	--	--	--	56	57	58	59	61	61	60	59	60	64	63	63	63	60	62	61	-	58
July																																
Maximum.....	75	72	66	70	73	73	75	75	76	73	77	73	67	67	70	72	70	69	72	75	74	70	74	75	75	72	67	75	77	74	70	72
Minimum.....	63	62	61	56	60	62	60	60	62	61	61	63	62	60	58	60	60	61	59	60	60	62	60	62	63	63	63	62	64	63	62	61
August																																
Maximum.....	73	76	74	74	66	72	74	75	75	69	76	76	76	76	77	73	75	74	--	--	--	65	68	74	70	71	70	60	58	65	66	71
Minimum.....	60	62	64	62	60	59	61	62	62	63	59	61	61	60	60	61	61	60	--	--	--	62	58	54	55	58	58	55	55	53	52	59
September																																
Maximum.....	70	70	69	70	70	70	68	70	62	62	62	65	65	67	68	67	68	69	--	66	63	65	66	66	67	66	61	62	59	60	-	66
Minimum.....	54	55	57	54	54	56	54	50	47	50	54	55	53	53	60	54	54	54	--	53	58	56	54	54	54	52	53	56	52	47	-	54

MADISON RIVER BASIN

48. Madison River above Hebgen Lake, near West Yellowstone, Mont.

Water temperatures (°F), January to December 1962--Continued

Month	Day 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
October																																
Maximum.....	63	64	63	62	57	57	58	55	53	54	58	59	59	54	56	56	58	56	58	56	56	54	56	56	--	--	--	56	56	56	55	57
Minimum.....	48	51	52	52	55	53	50	50	52	52	53	53	52	48	46	49	46	46	48	46	48	46	47	45	--	--	--	44	45	45	45	49
November																																
Maximum.....	53	54	54	53	51	52	47	47	48	49	47	48	49	46	49	47	48	45	46	46	44	42	42	43	45	39	43	43	--	--	-	47
Minimum.....	44	44	45	44	45	45	40	39	42	44	42	45	42	38	44	41	37	38	40	40	40	39	37	35	37	38	38	39	--	--	-	41
December																																
Maximum.....	--	45	42	38	42	46	43	46	47	48	46	44	--	--	--	47	45	44	46	45	42	39	37	34	34	33	--	--	--	40	41	--
Minimum.....	--	41	38	34	35	42	41	42	44	45	44	40	--	--	--	42	40	38	42	40	38	34	32	32	32	33	--	--	--	34	34	--

Water temperatures (°F), January 1963

January																																
Maximum.....	40	44	46	48	44	42	39	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Minimum.....	34	38	41	42	38	35	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1961	Max	--	--	--	--	--	--	--	77	70	60	--	46
	Min	--	--	--	--	--	--	--	58	47	38	--	32
1962	Max	46	48	58	65	66	76	77	77	70	64	54	48
	Min	32	33	34	42	48	50	56	52	47	44	35	32
1963	Max	48	--	--	--	--	--	--	--	--	--	--	--
	Min	--	--	--	--	--	--	--	--	--	--	--	--

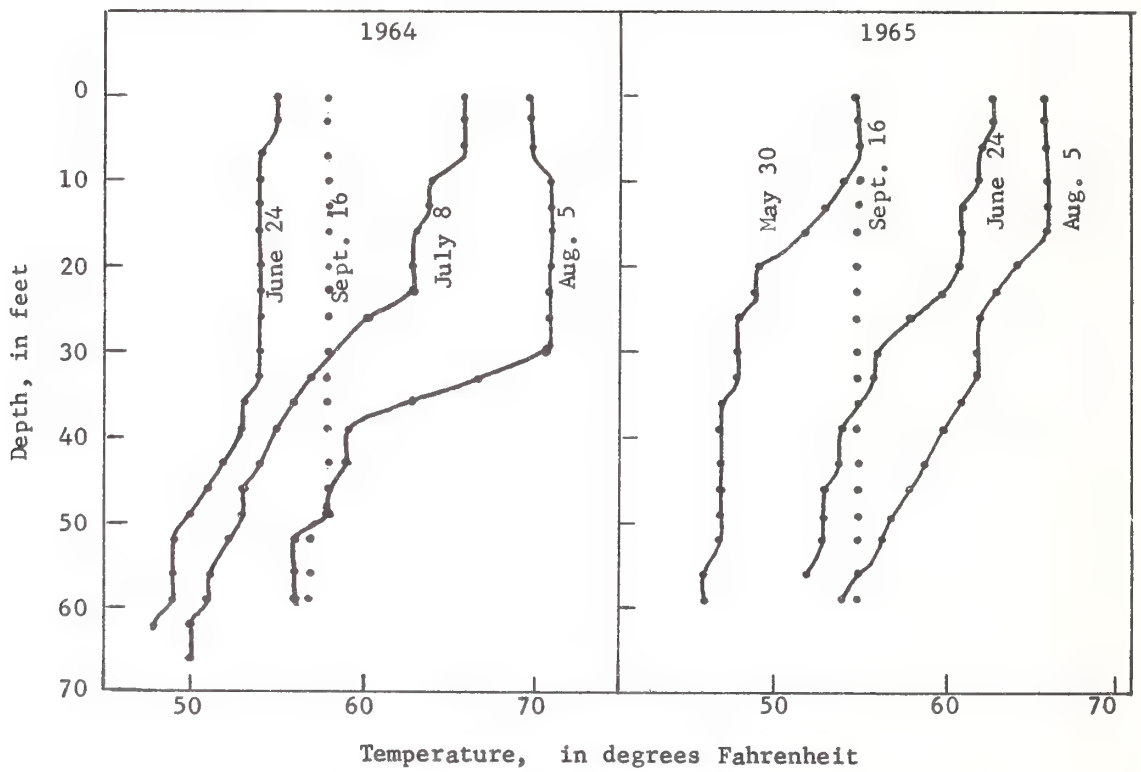
49. Hebgen Lake near West Yellowstone, Mont. (6-0380)

Location.--Lat 44°48'45", long 111°16'00", in SW¼ sec.5, T.12 S., R.4 E., 5½ miles upstream from Hebgen Dam, and 13 miles northwest of West Yellowstone. Elevations of lake at maximum stage is 6,534.87 ft above mean sea level (levels by The Montana Power Co.).

Water temperature records available.--29 vertical profiles taken during summer of 1964 and 1965 published in this report. During 1964, temperatures were obtained at 4 other sites and the plotted profiles showed close agreement with profiles at this site.

Remarks.--The change in temperature profile with time is typical of deep reservoirs having a volume large enough not to be greatly affected by the temperature of inflowing water. The approximately vertical profile shown in September results from the cooling of the water at the surface. As it cools it gets heavier and moves down to be replaced by warmer, lighter water from below. In a short time, enough water has been cooled to replace water of a higher temperature to a depth of 60 ft.

Cooperation.--Profiles obtained from doctoral thesis by Martin (Limnological Studies on Hebgen Lake, Montana, Danny Bernard Martin, Montana State University, Ph.D. thesis, 1967).



Selected temperature profiles during 1964 and 1965

49. Hebgen Lake near West Yellowstone, Mont. (6-0380)

Water temperatures in °F -- 1964

Depth (ft)	June 24	July 1	July 8	July 15	July 22	July 29
0	55	60	66	68	71	71
3	55	60	66	68	71	71
7	54	59	66	68	71	71
10	54	59	64	68	70	71
13	54	59	64	68	70	71
16	54	58	63	67	70	71
20	54	58	63	66	70	71
23	54	56	63	64	69	71
26	54	55	60	61	66	71
30	54	54	58	58	62	69
33	54	54	57	57	59	67
36	53	54	56	56	57	62
39	53	53	55	55	56	59
43	52	53	54	54	55	59
46	51	52	53	54	55	58
49	50	51	53	54	55	58
52	49	51	52	54	54	56
56	49	51	51	58	54	56
59	49	50	51	58	54	56
62	48	49	50	58	54	--
66	--	49	50	--	54	--

Depth (ft)	Aug. 5	Aug. 12	Sept. 2	Sept. 2	Sept. 16	Sept. 23
0	70	68	61	60	58	56
3	70	68	61	60	58	56
7	70	68	61	60	58	56
10	71	68	61	60	58	56
13	71	68	61	60	58	56
16	71	68	61	60	58	56
20	71	68	61	60	58	56
23	71	68	61	60	58	56
26	71	68	61	60	58	56
30	71	68	61	60	58	56
33	67	68	61	60	58	56
36	62	67	61	60	58	56
39	59	64	61	60	58	56
43	59	59	61	59	58	56
46	58	58	61	59	58	56
49	58	56	61	58	58	56
52	58	55	61	58	57	56
56	56	55	60	57	57	--
59	56	54	60	57	57	--
62	--	--	60	56	--	--
66	--	--	60	--	--	--

49. Hebgen Lake near West Yellowstone, Mont. (6-0380)

Water temperatures in °F -- 1965

Depth (ft)	May 30	June 6	June 17	June 24	July 1	July 8
0	55	61	58	63	63	66
3	55	59	58	63	63	66
7	55	56	58	62	60	66
10	54	56	58	62	60	66
13	53	56	58	61	60	63
16	52	54	58	61	59	63
20	49	54	58	61	59	62
23	49	54	58	60	59	62
26	48	53	58	58	59	60
30	48	52	58	56	59	59
33	48	51	56	56	59	59
36	47	51	55	55	59	58
39	47	49	54	54	58	57
43	47	49	53	54	58	56
46	47	48	53	53	56	56
49	47	48	53	53	55	55
52	47	48	51	53	54	55
56	46	47	51	52	--	55
59	46	47	51	--	--	54

Depth (ft)	July 22	July 29	Aug. 5	Aug. 12	Aug. 19	Aug. 26
0	63	67	66	66	67	59
3	64	66	66	66	66	59
7	64	64	66	66	63	59
10	64	63	66	66	62	59
13	64	63	66	66	62	59
16	64	63	66	64	62	59
20	64	62	64	64	62	59
23	64	61	63	63	62	59
26	64	60	62	63	62	59
30	62	59	62	62	62	59
33	62	57	62	60	62	59
36	60	56	61	58	61	58
39	58	55	60	56	60	58
43	56	54	59	56	56	56
46	55	53	58	55	54	55
49	54	53	57	55	53	53
52	54	--	56	53	53	51
56	53	--	55	52	52	--
59	53	--	54	--	50	--

49. Hebgen Lake near West Yellowstone, Mont. (6-0380)

Water temperatures in °F -- 1965

Depth (ft)	Sept. 2	Sept. 9	Sept. 16	Sept. 23	Oct. 2	
0	62	58	55	58	54	
3	62	58	55	58	50	
7	62	58	55	58	50	
10	61	58	55	58	49	
13	61	58	55	58	49	
16	61	58	55	58	49	
20	60	58	55	58	49	
23	60	58	55	58	49	
26	60	58	55	58	49	
30	60	58	55	58	49	
33	60	58	55	58	49	
36	60	58	55	58	49	
39	60	58	55	58	49	
43	60	58	55	58	49	
46	59	58	55	58	49	
49	59	58	55	52	49	
52	58	56	55	52	49	
56	56	56	55	--	49	
59	55	55	55	--	--	

50. Madison River below Hebgen Lake, near Grayling, Mont. (6-0385)

Location.--At gaging station, lat 44°52'00", long 111°20'15", near northeast corner of sec.22, T.11 S., R.3 E., on right bank 1,500 ft downstream from Hebgen Dam, 8 miles northwest of Grayling, 17 miles upstream from West Fork, and at mile 103. Datum of gage is 6,448.47 ft above mean sea level (after 1959 earthquake), datum of 1929, supplementary adjustment of 1940.

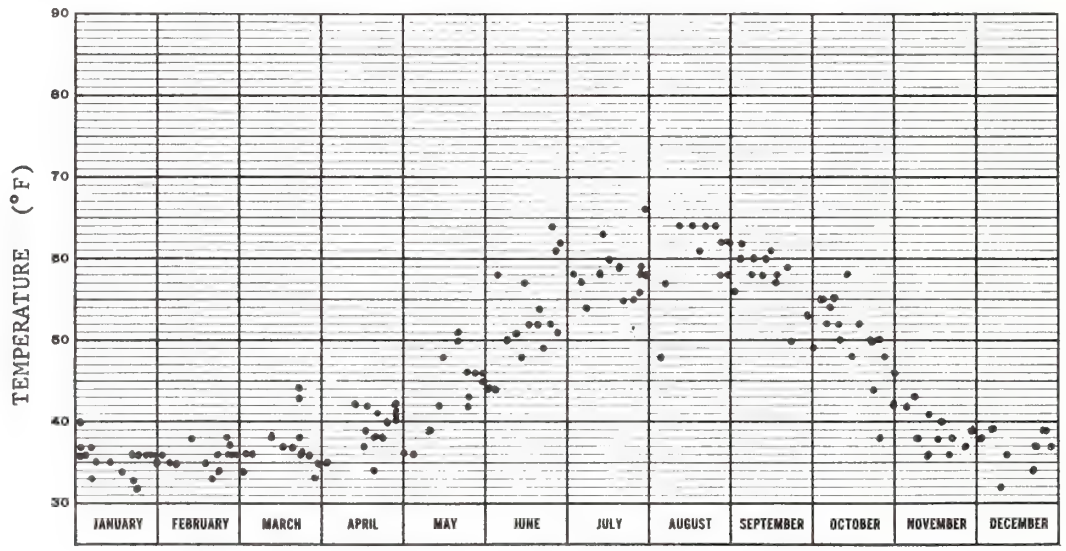
Drainage area.--905 sq mi.

Water temperature records available.--161 spot observations made at time of discharge measurements during period March 1949 to December 1965. Thermograph record August 1961 to December 1962 published in this report.

Extremes.--Discharge 1938-65: Maximum, 10,200 cfs Aug. 17, 1959, caused by wave over Hebgen Dam during earthquake; maximum unaffected by earthquake wave, 5,980 cfs June 3, 1943; minimum daily, 5.0 cfs May 9-12, 1960.
Water temperatures 1949-65: Maximum observed, 66°F July 27, 1960; minimum observed, 32°F Dec. 13, 1955, Jan. 28, 1956.

Remarks.--Water temperatures affected by storage in Hebgen Lake.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1949-65

50. Madison River below Hebgen Lake, near Grayling, Mont. (6-0385)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-50	1400	33	27-51	1500	37	1-49	1700	34	28-53	1230	38	1-50	1300	36	21-50	1600	54
4-51	1100	37	28-53	1230	36	27-53	1600	43	28-54	1500	41	23-51	1100	51	16-53	1000	52
31-51	1315	35	3-54	1130	35	2-54	1030	36	1-55	0850	35	2-52	1045	36	9-54	1130	51
2-52	1600	40	1-55	1600	36	27-54	1700	38	28-55	1400	34	26-53	1300	46	15-55	1500	57
3-53	1210	36	28-56	1220	36	3-55	1040	36	28-56	1415	38	18-54	1100	42	5-56	1930	58
27-53	1545	33	7-57	1030	35	30-56	0935	35	25-58	1105	38	25-55	0840	42	20-57	0850	52
5-54	1030	35	26-57	1450	34	27-57	1325	36	30-59	1500	40	29-56	0825	45	26-58	1440	62
28-56	1010	32	19-58	1555	38	19-58	1330	38	30-60	1530	42	15-57	1500	39	24-59	1700	64
4-57	1400	37	24-60	1530	35	25-59	1725	37	4-61	1330	50	19-60	1130	48	8-60	1530	50
14-58	1740	35	26-62	1230	36	23-60	1530	37	27-61	1330	42	23-62	1530	50	25-62	1510	61
21-59	1300	34	27-63	1000	38	30-62	1130	33	24-62	1500	42	25-63	1630	43	1-63	1800	44
30-62	0900	36	29-64	0930	36	27-63	1335	39	27-63	1100	39	25-64	1900	46	2-63	1000	44
2-63	1300	37	25-65	0830	33	28-64	1530	36	29-64	1300	40	28-65	1030	46	22-63	0900	49
29-63	1635	36				28-65	1430	44	27-65	1500	37				10-64	1330	48
2-64	1330	36													23-64	1530	52
30-64	1630	36													25-65	1600	51
28-65	1700	36															
July			August			September			October			November			December		
25-50	0750	59	6-52	0815	48	16-49	1100	50	1-50	0830	49	29-50	1345	37	28-54	1610	34
2-52	1200	58	24-55	1005	64	1-50	1400	56	23-51	1130	38	27-51	1130	38	13-55	1525	32
7-53	1330	57	7-56	0950	57	27-51	1000	53	9-52	1230	50	5-52	1600	43	17-57	1715	36
8-54	1100	54	13-57	0835	64	4-52	1230	58	6-53	1300	54	5-53	1200	38	28-61	0900	37
13-55	1135	59	21-58	1000	64	2-53	1140	62	12-54	1505	52	17-54	0900	41	6-62	1635	39
10-56	1025	58	17-59	1630	64	9-54	1235	61	5-55	1320	52	4-55	1435	42	30-64	1500	37
11-57	1000	63	27-60	0930	62	12-56	1330	57	17-56	0910	50	27-56	1405	36	1-65	1130	38
24-58	0830	56	29-61	1315	58	2-59	1230	60	16-57	0830	50	16-57	0910	36	29-65	1320	39
27-60	1430	66	29-63	1300	62	4-59	1430	60	16-58	1800	44	30-59	1400	39			
21-61	1100	55	27-64	1030	58	6-59	1735	58	7-60	1200	55	20-63	1700	40			
26-62	1350	58	18-65	1000	61	12-59	1700	58	11-61	1100	48	19-64	1230	38			
25-63	1800	58				15-59	1800	59	31-61	1600	42						
23-64	0900	55				7-62	1000	60	4-62	0900	55						
12-65	1700	60							31-62	1300	46						
									10-63	1600	58						
									9-64	1230	52						
									26-65	1500	48						

MADISON RIVER BASIN

50. Madison River below Hebgen Lake, near Grayling, Mont. (6-0385)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), August to December 1961																																
August																																
Maximum.....	--	55	--	--	--	--	--	--	55	55	55	54	55	55	--	55	56	56	56	55	55	56	55	58	58	57	56	59	58	--	60	--
Minimum.....	--	50	--	--	--	--	--	--	52	52	52	52	52	52	--	53	51	52	54	54	53	53	52	53	54	55	53	54	56	--	50	--
September																																
Maximum.....	58	56	--	--	57	58	57	56	56	56	57	--	56	56	56	56	56	--	54	55	54	54	54	53	53	--	53	53	52	52	-	55
Minimum.....	52	54	--	--	56	56	52	51	52	51	52	--	54	56	55	55	55	--	51	54	53	53	53	52	52	--	52	52	52	51	-	53
October																																
Maximum.....	51	51	51	51	51	51	50	49	48	--	49	48	48	48	48	48	48	47	48	47	47	46	46	46	45	45	45	44	43	42	42	47
Minimum.....	50	50	50	51	51	50	48	48	48	--	48	48	48	47	47	48	47	47	46	47	46	46	46	45	45	45	44	43	42	42	42	47
November																																
Maximum.....	42	42	41	40	40	39	38	38	38	38	38	38	38	--	36	37	37	37	37	37	37	37	37	37	40	37	37	37	37	37	-	38
Minimum.....	42	41	40	40	39	38	38	37	37	37	38	38	36	--	36	36	36	36	36	37	37	37	37	37	37	37	37	37	37	37	-	38
December																																
Maximum.....	40	37	37	37	37	--	--	38	37	37	37	38	37	37	38	37	37	37	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum.....	36	37	37	37	37	--	--	37	37	36	36	37	37	37	37	37	37	37	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Water temperatures (°F), January to December 1962																																
January																																
Maximum.....	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	37	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	37	--
February																																
Maximum.....	38	38	38	37	37	--	38	38	38	38	37	--	--	--	--	--	--	--	--	--	--	37	38	37	37	37	37	--	-	-	-	--
Minimum.....	37	37	37	36	37	--	38	38	38	37	37	--	--	--	--	--	--	--	--	--	--	37	37	37	37	36	36	--	-	-	-	--
March																																
Maximum.....	--	38	37	37	38	37	37	37	--	--	--	--	--	38	38	38	38	37	37	--	--	--	38	38	37	38	37	38	38	--	--	--
Minimum.....	--	37	37	37	37	37	37	37	--	--	--	--	--	37	37	37	37	37	37	--	--	--	37	37	37	37	37	37	37	--	--	--
April																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	38	38	38	38	38	39	--	40	40	40	--	--	--	--	--	40	39	40	41	-	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	37	38	37	37	37	37	--	38	38	38	--	--	--	--	--	39	38	37	38	-	--
May																																
Maximum.....	41	40	--	42	42	41	41	42	42	42	43	42	42	44	42	46	--	46	--	--	--	--	--	--	--	51	49	48	51	50	50	52	--
Minimum.....	38	39	--	40	40	40	40	40	40	40	41	41	40	42	41	42	--	43	--	--	--	--	--	--	--	47	47	46	47	47	48	48	--
June																																
Maximum.....	50	52	52	52	52	51	50	50	51	54	51	56	55	52	51	53	53	57	57	55	56	56	58	59	60	63	62	61	60	62	-	55
Minimum.....	48	47	49	50	51	48	48	49	50	50	48	52	51	49	50	51	50	53	54	53	55	55	55	55	56	56	58	58	58	60	-	52
July																																
Maximum.....	63	62	61	62	62	64	62	61	61	59	58	--	56	57	59	58	60	57	58	57	57	57	57	57	57	57	58	58	58	--	58	59
Minimum.....	60	58	55	57	60	56	58	59	59	56	55	--	54	53	56	55	55	53	55	55	55	56	56	56	55	56	56	56	56	--	55	56
August																																
Maximum.....	58	58	61	62	59	60	61	62	62	60	59	59	60	60	59	60	60	60	61	60	63	60	60	61	61	61	62	60	60	59	60	60
Minimum.....	56	57	57	55	55	58	58	57	58	58	58	58	58	58	58	59	59	58	57	58	59	58	58	60	59	58	57	58	58	57	59	58
September																																
Maximum.....	60	59	58	58	58	59	59	57	58	58	58	58	57	58	56	56	56	--	--	56	55	56	58	55	55	56	56	56	56	55	-	57
Minimum.....	59	57	54	58	58	58	56	56	57	57	58	57	57	56	56	56	56	--	--	55	54	55	55	55	54	55	55	56	55	54	-	56

MADISON RIVER BASIN

50. Madison River below Hebgen Lake, near Grayling, Mont. (6-0385)

Water temperatures (°F), January to December 1962--Continued

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum.....	55	55	54	55	55	--	--	54	54	54	54	54	53	53	52	52	52	52	51	51	50	52	50	--	--	--	--	49	49	49	49	52
Minimum.....	54	54	54	54	54	--	--	54	54	54	53	53	53	52	52	51	50	50	50	50	50	50	48	--	--	--	--	48	48	48	48	51
November																																
Maximum.....	49	48	48	48	48	48	--	47	47	46	46	46	46	46	48	45	45	44	44	44	42	42	42	42	42	--	--	--	--	--	-	--
Minimum.....	48	48	46	47	47	48	--	46	46	46	46	46	46	45	45	45	44	43	43	42	42	41	40	41	40	--	--	--	--	--	-	--
December																																
Maximum.....	38	37	36	37	37	37	38	36	36	36	--	--	--	--	43	42	42	42	42	42	42	42	42	41	41	--	--	--	--	--	--	--
Minimum.....	37	36	36	36	37	36	36	36	36	36	--	--	--	--	42	42	42	42	42	42	42	41	41	41	41	--	--	--	--	--	--	--

Summary of thermograph record

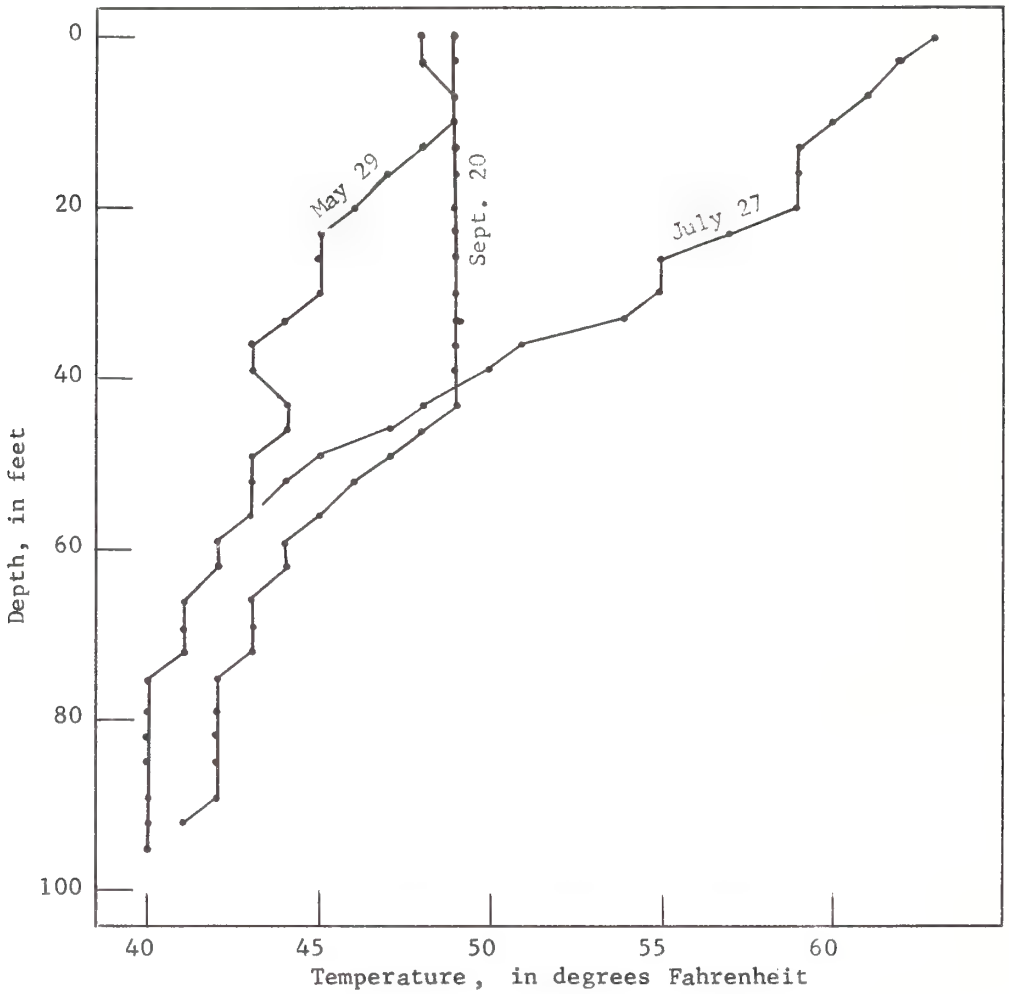
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1961	Max	--	--	--	--	--	--	--	60	58	51	42	40
	Min	--	--	--	--	--	--	--	50	51	42	36	--
1962	Max	--	38	38	41	52	63	64	63	60	55	49	43
	Min	--	36	37	37	38	47	53	55	54	48	40	36

51. Quake Lake near West Yellowstone, Mont.

Location.--Lat 44°49'35", long 111°25'45", in S½ sec.36, T.11 S., R.2 E., 300 ft upstream from outlet, 19 miles northwest of West Yellowstone. Elevation of lake at maximum stage, about 6,400 ft above mean sea level.

Water temperature records available.--18 vertical profiles taken during summer of 1965 published in this report.

Cooperation.--Data supplied by Director of Environmental Studies, Montana State University, Bozeman, Mont.



Selected temperature profiles during 1965

51. Quake Lake near West Yellowstone, Mont.

Water temperatures in °F -- 1965

Depth (feet)	May 29	June 5	June 12	June 22	June 29	July 6	July 13	July 20	July 27
0	48	51	46	56	59	61	58	59	63
3	48	51	46	56	58	61	58	61	62
7	49	51	46	55	57	59	57	61	61
10	49	50	46	55	56	58	57	60	60
13	48	49	46	55	55	57	56	59	59
16	47	48	46	55	55	55	55	56	59
20	46	46	46	54	55	54	54	56	59
23	45	45	46	53	54	53	53	54	57
26	45	45	46	51	54	52	53	54	55
30	45	45	46	50	53	52	51	53	55
33	44	45	46	50	52	51	50	53	54
36	43	44	46	49	51	51	48	51	51
39	43	44	46	48	51	50	47	51	50
43	44	44	46	47	51	50	47	49	48
46	44	43	44	47	51	49	46	48	47
49	43	43	43	46	49	47	44	47	45
52	43	43	43	46	48	46	44	46	44
56	43	42	43	45	47	46	43	44	43
59	42	42	42	43	46	45	42	43	42
62	42	42	42	42	44	44	42	42	42
66	41	42	42	42	44	43	41	42	41
69	41	41	41	42	43	43	40	41	41
72	41	41	41	42	43	43	40	41	41
75	40	41	41	41	43	42	40	41	41
79	40	41	41	41	42	42	40	40	40
82	40	41	41	41	42	42	40	40	40
85	40	40	40	41	42	41	40	40	40
89	40	40	41	41	42	41	40	40	40
92	40	40	41	41	41	41	40	40	40
95	40	40	40	41	41	41	40	40	40

51. Quake Lake near West Yellowstone, Mont.

Water temperatures in °F -- 1965

Depth (feet)	Aug. 3	Aug. 10	Aug. 17	Aug. 24	Aug. 31	Sept. 7	Sept. 14	Sept. 20	Oct. 2
0	61	59	61	55	56	55	53	49	49
3	61	59	61	55	56	56	53	49	49
7	61	59	61	54	56	55	53	49	49
10	59	59	60	54	56	54	53	49	48
13	57	59	58	53	56	54	53	49	48
16	56	58	58	51	56	54	53	49	48
20	56	56	56	51	56	54	53	49	48
23	54	55	56	49	55	54	53	49	48
26	53	54	54	48	55	54	53	49	48
30	52	54	53	47	55	54	53	49	48
33	51	53	51	46	55	54	53	49	48
36	50	51	49	44	54	54	53	48	47
39	48	49	48	44	53	53	51	49	47
43	47	48	46	41	51	51	49	49	47
46	45	46	45	40	48	48	49	48	47
49	44	44	44	40	47	46		47	47
52	43	43	43	40	45	45		46	47
56	43	42	41	40	44	44		45	47
59	42	41	41	40	43	44		44	47
62	41	41	40	40	43	43		44	45
66	40	40	40	40	43	43		43	44
69	40	40	40	39	42	41		43	44
72	40	40	40	--	42	41		43	42
75	40	40	40	--	42	41		42	42
79	40	40	40	--	41	41		42	41
82	40	40	40	39	41	40		42	42
85	40	40	40	39	41	40		42	42
89	40	40	40	39	41	40		42	41
92	40	40	40	39	40	40		41	41
95	40	40	--	--	40	40		--	--

52. Madison River at Kirby Ranch, near Cameron, Mont. (6-0388)

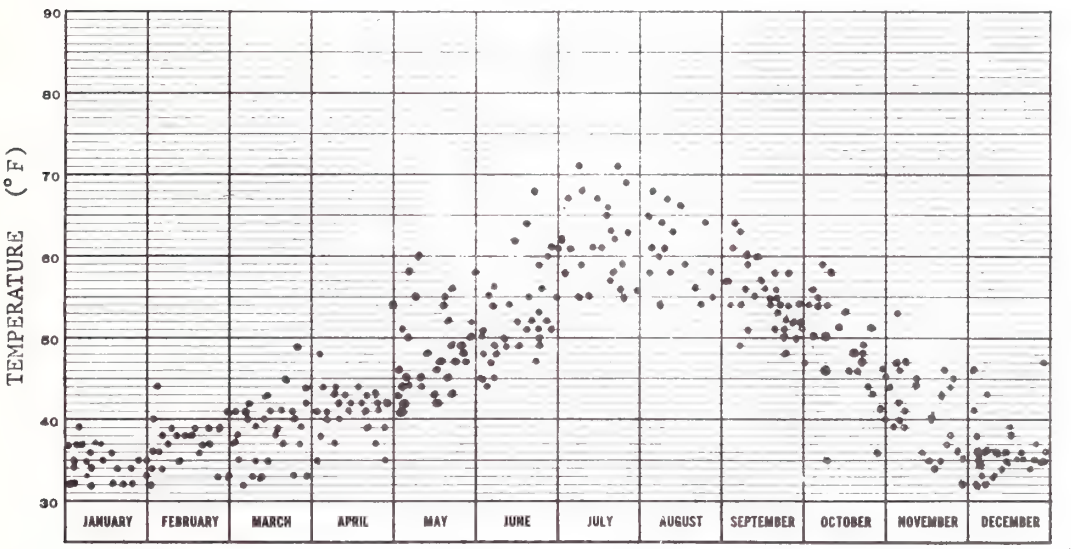
Location.--At gaging station, lat 44°53'22", long 111° 34'46", in NE¼SW¼ sec.10, T.11 S., R.1 E., on right bank 75 ft upstream from county bridge, a quarter of a mile upstream from West Fork, and 22 miles southeast of Cameron. Altitude of gage is 5,860 ft (from topographic map).

Drainage area.--1,065 sq mi.

Water temperature records available.--383 spot observations made at time of discharge measurement or sediment sampling during periods August 1959 to October 1963, August, October 1965. Once-daily observations made during period October 1959 to September 1960 (fragmentary) published in reports of the Geological Survey.

Extremes.--Discharge 1959-63: Maximum, 4,710 cfs Oct. 23, 1959, minimum daily, 280 cfs May 26, 27, 1960.

Water temperatures, 1959-63, 1965: Maximum observed, 71°F July 7, 25, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1959-63, 1965

52. Madison River at Kirby Ranch, near Cameron, Mont. (6-0388)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
1-61	a	32	3-60	1200	34	1-61	1700	37	10-60	1300	40	20-60	1300	52	11-60	2000	50
3-61	a	32	1-61	a	32	1-61	a	37	29-60	1200	38	2-61	a	44	3-61	a	51
7-61	a	36	1-61	1700	36	4-61	a	32	1-61	a	41	3-61	a	42	6-61	a	55
11-61	a	35	2-61	a	36	8-61	a	42	4-61	a	41	4-61	1400	50	7-61	a	56
14-61	a	37	4-61	a	34	11-61	a	35	5-61	1500	44	6-61	a	58	10-61	a	49
17-61	a	35	7-61	a	38	15-61	a	43	8-61	a	40	9-61	a	60	14-61	a	62
21-61	a	32	11-61	a	39	18-61	a	38	11-61	a	40	13-61	a	47	18-61	a	64
24-61	a	32	15-61	a	38	21-61	a	37	15-61	a	42	16-61	a	43	22-61	a	68
28-61	a	34	18-61	a	37	25-61	a	41	18-61	a	42	17-61	a	46	24-61	a	56
3-62	1450	34	21-61	a	39	28-61	a	37	22-61	a	44	20-61	a	45	27-61	a	60
6-62	1120	37	25-61	a	37	3-62	1330	38	25-61	a	42	24-61	a	43	2-62	1040	48
10-62	1130	32	28-61	a	41	6-62	0810	35	29-61	a	42	27-61	a	49	5-62	0835	44
13-62	1230	34	3-62	1245	36	7-62	1330	41	3-62	2115	38	30-61	a	52	7-62	1440	54
16-62	1445	36	6-62	1110	34	7-62	1700	35	4-62	1100	41	1-62	1000	43	9-62	0840	49
20-62	1330	32	10-62	1600	37	10-62	1135	33	7-62	1120	40	3-62	1030	46	12-62	0735	49
23-62	1445	32	13-62	1520	38	13-62	1515	40	10-62	1110	42	5-62	1715	51	17-62	0830	49
27-62	1140	35	17-62	1140	38	17-62	1045	35	14-62	1015	43	9-62	1400	55	19-62	0820	51
30-62	1115	35	21-62	1240	36	20-62	1515	41	17-62	1030	43	12-62	1615	45	21-62	0850	52
31-62	0900	33	24-62	1100	33	24-62	1430	41	21-62	1045	43	14-62	1440	48	23-62	0830	49
31-62	1130	35	28-62	1110	33	27-62	1050	40	25-62	1130	42	16-62	2000	42	25-62	1130	59
1-63	1330	37	2-63	1530	40	29-62	0830	33	27-62	0830	37	19-62	1610	54	27-62	0800	53
3-63	1340	35	5-63	1445	44	31-62	1345	44	28-62	1050	35	22-62	1600	56	29-62	1620	61
3-63	1430	37	7-63	1210	38	2-63	1330	41	2-63	1120	35	26-62	1115	49	30-62	1630	61
5-63	1340	39	9-63	1030	37	6-63	1330	41	4-63	0850	37	30-62	1110	50	1-63	1600	45
8-63	1025	33	12-63	1110	35	6-63	1510	40	6-63	1345	44	31-62	1415	58	1-63	1710	50
12-63	1310	36	16-63	1300	39	9-63	1045	39	10-63	1330	43	2-63	0935	41	4-63	1740	47
16-63	1400	37	19-63	1110	37	12-63	1100	33	13-63	0830	42	4-63	1045	45	6-63	1150	45
20-63	1115	32	23-63	1005	37	16-63	1500	41	16-63	1620	42	7-63	0930	44	8-63	1700	48
23-63	1415	34	26-63	0935	37	19-63	1115	39	20-63	1110	41	11-63	0900	44	12-63	1800	54
26-63	1100	32	26-63	1545	39	23-63	1125	45	24-63	1025	41	15-63	0840	43	15-63	0945	52
29-63	1345	33				26-63	1445	49	27-63	0930	39	18-63	0945	47	18-63	1715	55
29-63	1615	35				28-63	1005	39	30-63	1440	54	18-63	1710	55	22-63	0925	47
						30-63	1030	42				21-63	1005	49	22-63	1200	51
												25-63	0810	47	25-63	0820	50
												26-63	1050	48	29-63	0840	51
												28-63	0815	47	30-63	1930	55

a Between 0800 and 1900 hours.

52. Madison River at Kirby Ranch, near Cameron, Mont. (6-0388)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
28-60	1700	69	31-59	1730	52	9-59	1730	49	8-60	a	35	29-59	1200	36	3-60	a	38
1-61	a	62	2-61	a	58	10-59	2030	56	10-60	a	46	3-60	1530	39	6-60	a	34
5-61	a	67	3-61	a	68	11-59	1620	60	22-60	a	47	5-60	a	40	10-60	a	33
7-61	a	71	5-61	a	60	16-59	1330	60	25-60	a	49	8-60	a	41	13-60	a	34
8-61	a	68	9-61	a	64	16-59	1800	56	30-60	a	41	12-60	a	45	13-60	1200	36
12-61	a	59	15-61	a	63	17-59	1700	57	31-60	a	45	15-60	a	40	17-60	a	35
15-61	a	67	23-61	a	58	18-59	0800	54	3-61	0925	50	19-60	a	34	20-60	a	34
17-61	a	61	26-61	a	57	18-59	1830	55	4-61	1400	55	22-60	a	37	24-60	a	35
19-61	a	61	28-61	1600	64	19-59	0800	54	7-61	1030	59	26-60	a	44	27-60	a	36
19-61	1110	62	29-61	a	58	19-59	1730	56	9-61	1230	50	29-60	a	32	31-60	a	35
22-61	a	65	2-62	1230	65	20-59	0800	54	11-61	1115	46	30-60	a	35	2-61	1530	41
25-61	a	71	4-62	1030	61	20-59	1730	56	14-61	1145	53	4-61	1510	42	5-61	1100	36
29-61	a	63	7-62	0720	54	21-59	0830	51	17-61	1040	48	7-61	0925	39	6-61	1040	33
3-62	1330	58	11-62	1100	61	22-59	0800	55	21-61	1145	46	11-61	0930	39	9-61	1110	32
7-62	1135	61	13-62	1535	67	22-59	1800	55	25-61	1100	44	14-61	0915	36	13-61	1010	34
10-62	0730	55	14-62	0730	58	23-59	0800	53	28-61	1145	43	18-61	1100	34	16-61	1120	35
14-62	0800	55	18-62	0800	57	23-59	1730	56	31-61	1610	45	21-61	0935	35	20-61	1430	39
17-62	1100	61	21-62	0915	59	24-59	0800	51	2-62	1140	54	25-61	1030	38	23-61	1125	35
17-62	1515	66	25-62	0810	56	25-59	0800	54	4-62	1150	56	28-61	1100	36	27-61	1430	34
17-62	1540	63	28-62	0840	54	25-59	1830	54	6-62	1515	54	2-62	0830	44	29-61	1615	36
21-62	0800	57	29-63	0900	55	26-59	0800	50	9-62	0850	54	3-62	1430	53	1-62	1400	46
24-62	0815	58	18-65	1630	66	26-59	1830	52	13-62	0940	51	5-62	1600	46	4-62	0935	35
27-62	0900	59				27-59	0730	52	17-62	0930	46	7-62	1615	47	4-62	1115	36
28-62	0800	56				28-59	0800	50	21-62	1115	49	10-62	0920	47	7-62	1030	32
31-62	0745	56				28-59	1830	54	23-62	1040	48	13-62	0830	44	8-62	1340	43
26-63	0840	55				29-59	0800	51	27-62	1600	51	17-62	1420	45	11-62	1050	36
						7-60	1600	61	30-62	0815	46	20-62	1100	43	15-62	1145	38
						2-61	a	57	10-63	--	58	24-62	1245	46	19-62	1015	36
						5-61	a	54	27-65	1130	36	27-62	1040	45	22-62	1120	35
						9-61	a	54							25-62	1530	34
						12-61	a	51							29-62	1310	47
						16-61	a	54									
						21-61	a	48									
						23-61	a	48									
						26-61	a	52									
						30-61	a	47									
						1-62	0830	54									
						5-62	1430	64									
						6-62	1755	63									
						7-62	1230	56									
						8-62	1030	59									
						12-62	1320	55									
						15-62	1400	60									
						19-62	0745	53									
						22-62	0815	54									
						25-62	1130	58									
						29-62	0830	52									

a Between 0800 and 1900 hours.

53. Madison River near Cameron, Mont. (6-0400)

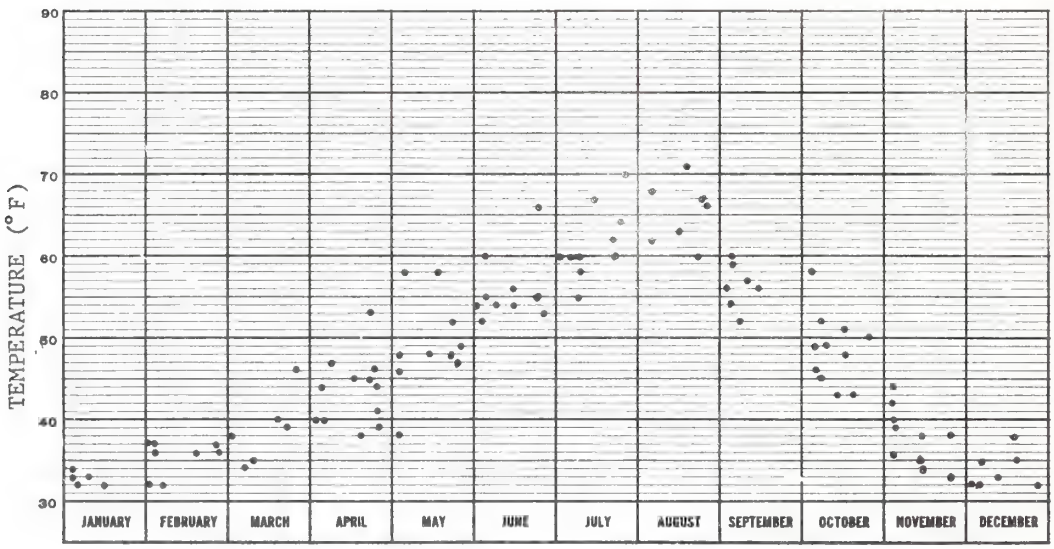
Location.--At gaging station, lat 45°14'00", long 111°45'00", at center of south line of sec.8, T.7 S., R.1 W., on right bank 30 ft downstream from Varney Bridge, 1½ miles downstream from Wigwam Creek, and 4 miles northwest of Cameron. Altitude of gage is 5,135 ft (from topographic map).

Drainage area.--1,669 sq mi.

Water temperature records available.--103 spot observations made at time of discharge measurements during periods November 1951 to October 1958, September 1959 to October 1963.

Extremes.--Discharge 1951-58, 1959-63: Maximum, 6,670 cfs June 7, 1952; minimum daily, 275 cfs Aug. 31, 1959.

Water temperatures 1951-58, 1959-63: Maximum observed, 71°F Aug. 20, 1958; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-58, 1959-63

53. Madison River near Cameron, Mont. (6-0400)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-53	1530	34	27-53	1630	36	27-53	1200	46	28-53	0815	44	2-52	1510	38	15-53	1800	54
5-54	1530	32	3-54	1700	37	12-57	1450	35	6-54	1630	40	26-53	1030	52	15-55	1935	56
10-57	1530	33	1-55	1245	32	18-58	1605	40	28-54	1130	41	18-54	1400	58	5-56	1350	55
15-58	0920	32	7-56	1320	32	6-60	1030	34	19-55	1435	38	25-55	1255	48	20-57	1600	55
3-63	1435	33	19-58	0850	36	1-61	1500	38	27-55	1600	46	2-56	1350	46	26-58	0745	53
			3-60	1500	36	28-63	0805	39	4-56	1315	40	28-56	1805	49	11-60	1830	54
			1-61	1430	37				16-57	1435	45	14-57	1705	48	5-61	1700	60
			26-63	1325	37				24-58	1505	45	3-60	1730	48	1-62	1725	54
									10-60	1700	47	4-61	1230	58	24-62	1835	66
									5-61	1230	44	26-63	0800	47	2-63	1330	52
									27-62	1030	39				22-63	1430	55
									26-63	1600	53						
July			August			September			October			November			December		
2-52	1700	60	7-52	1200	68	4-52	0945	54	9-52	1615	52	28-51	1030	38	1-52	1630	32
7-53	1700	60	24-55	1445	60	2-53	1030	56	6-53	1000	49	6-52	0900	40	3-53	1600	32
8-54	1500	55	7-56	1730	62	12-56	1100	57	13-54	0835	43	5-53	1600	44	28-54	1435	32
13-55	1415	67	13-57	1935	63	9-59	1030	52	5-55	1715	46	17-54	1215	38	13-55	1340	33
10-56	1945	60	20-58	1900	71	14-59	1000	56	16-56	1630	51	5-55	0800	36	17-57	1230	38
10-57	0925	58	27-61	1645	67	7-60	1400	60	17-57	0900	43	28-56	1540	33	18-61	1500	35
23-58	1730	62	28-63	1700	66	7-62	1600	59	16-58	1530	48	17-57	0820	34	8-62	0900	35
28-60	1500	70							8-61	1820	45	3-60	1400	39			
27-62	1200	64							4-62	1530	58	15-61	0900	35			
26-63	1115	60							10-63	1300	49	2-62	1130	42			

MADISON RIVER BASIN

54. Madison River at Ennis Mont.

Location.--At thermograph site, lat 45°20'40", long 111°43'30", in NE¼ sec.4, T.6 S., R.1 W., a quarter of a mile upstream from bridge on U. S. Highway 287 at Ennis. Altitude of gage is 4,930 ft (from topographic map).

Water temperature records available.--Thermograph record during period August 1961 to December 1962 published in this report.

Extremes.--Water temperatures 1961-62: Maximum recorded, 72°F Aug. 25, 1961; minimum, probably freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.

Water temperatures (°F), August to December 1961

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
August																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	70	65	66	70	63	--	--	70	66	70	72	69	67	67	65	62	59	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	60	57	55	56	58	--	--	57	60	59	59	58	57	57	55	55	54	--
September																																
Maximum.....	56	52	57	--	64	62	56	62	58	58	--	--	--	--	--	--	--	--	54	50	51	50	49	52	48	--	52	50	48	48	-	--
Minimum.....	50	47	47	--	55	56	53	52	52	52	--	--	--	--	--	--	--	--	46	49	46	44	44	42	44	--	44	46	43	42	-	--
October																																
Maximum.....	53	52	54	54	54	53	48	48	50	49	50	50	54	54	54	54	52	50	50	51	48	45	44	46	43	44	45	42	41	42	44	49
Minimum.....	46	44	45	46	47	48	45	42	43	46	47	46	48	46	46	46	47	43	44	46	40	40	40	41	38	42	42	35	34	36	38	43
November																																
Maximum.....	42	39	40	40	39	40	41	41	42	40	42	39	38	39	38	36	35	35	38	36	36	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	38	34	36	37	34	35	37	36	36	37	38	37	34	34	34	33	33	33	34	34	34	--	--	--	--	--	--	--	--	--	-	--
December																																
Maximum.....	--	--	--	--	--	34	34	34	38	37	38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum.....	--	--	--	--	--	32	32	32	34	35	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

MADISON RIVER BASIN

54. Madison River at Ennis, Mont.

Water temperatures (°F), April to December 1962

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
April																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	58	57	60	55	52	55	59	58	--	--	47	46	48	54	-	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	45	46	48	47	44	44	46	48	--	--	43	39	36	40	-	--
May																																
Maximum.....	--	--	--	62	54	55	56	55	58	56	53	52	50	53	48	54	60	58	57	60	53	56	--	--	55	55	54	58	60	60	62	56
Minimum.....	--	--	--	49	47	46	48	46	48	48	47	46	46	45	45	44	45	50	49	48	48	45	--	--	46	48	49	46	48	50	50	47
June																																
Maximum.....	58	60	54	48	50	51	56	60	56	58	56	55	58	55	56	53	57	60	58	59	56	60	60	62	63	63	--	--	60	61	-	57
Minimum.....	51	48	48	44	44	44	45	50	52	52	49	48	50	51	48	50	50	52	52	51	50	51	49	53	53	54	--	--	54	55	-	50
July																																
Maximum.....	63	60	58	62	--	61	64	66	65	67	--	--	61	63	64	65	63	60	65	67	68	68	70	69	66	63	64	68	66	68	64	65
Minimum.....	54	56	53	52	--	51	55	56	58	57	--	--	57	54	56	57	57	55	54	57	60	59	60	60	60	60	59	58	59	58	60	57
August																																
Maximum.....	68	66	67	64	60	64	68	68	68	64	69	68	68	--	69	64	66	66	64	68	64	60	63	64	63	63	61	--	--	--	--	63
Minimum.....	57	60	60	60	55	54	58	59	58	60	58	60	60	--	59	60	59	58	57	56	59	55	54	54	55	56	55	--	--	--	--	55
September																																
Maximum.....	64	62	58	61	62	64	--	--	--	--	--	--	--	--	56	57	54	58	56	56	--	--	--	--	--	--	--	55	58	55	55	-	--
Minimum.....	54	54	52	51	52	54	--	--	--	--	--	--	--	--	45	46	50	53	51	51	--	--	--	--	--	--	--	51	52	50	44	-	--
October																																
Maximum.....	56	57	56	56	--	54	54	54	53	52	52	52	52	51	52	52	52	52	53	50	52	--	--	--	--	--	--	51	51	52	50	--
Minimum.....	48	49	50	50	--	50	49	48	49	49	49	50	48	48	46	45	44	46	47	45	47	--	--	--	--	--	--	44	45	45	45	--
November																																
Maximum.....	48	49	49	--	--	--	--	44	43	44	42	45	45	--	43	--	--	--	40	43	43	40	37	38	--	--	--	--	--	--	--	-	--
Minimum.....	43	44	44	--	--	--	--	38	41	42	38	42	42	--	40	--	--	--	36	37	40	37	33	34	--	--	--	--	--	--	--	-	--
December																																
Maximum.....	--	--	--	--	37	39	38	41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum.....	--	--	--	--	33	36	36	37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1961	Max	--	---	---	--	--	--	--	--	64	54	42	--
	Min				--	--	--	--	54	42	34	--	32
1962	Max	--	---	--	60	62	63	70	69	64	57	49	--
	Min			--	36	44	44	51	54	44	44	33	--

55. Madison River below Ennis Lake, near McAllister, Mont. (6-0410)

Location.--At gaging station, lat 45°29'35", long 111°38'00", in NW¼ sec.17, T.4 S., R.1 E., on right bank 500 ft downstream from Madison powerplant, 1½ miles downstream from Ennis Lake, and 6 miles northeast of McAllister. Altitude of gage is 4,700 ft (from topographic map).

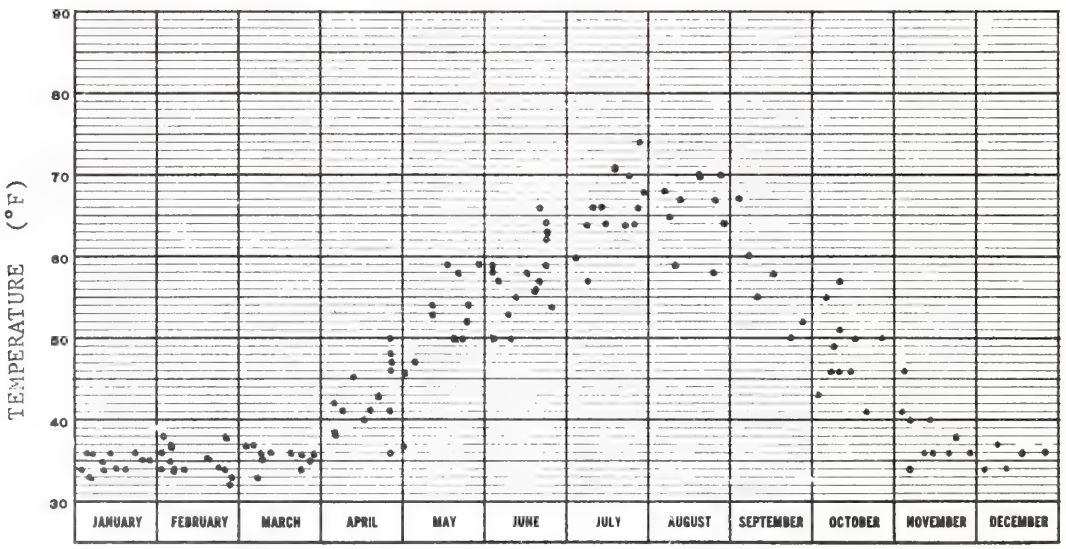
Drainage area.--2,186 sq mi.

Water temperature records available.--141 spot observations made at time of discharge measurements during period September 1949 to December 1965. Thermograph record during period August 1961 to December 1962 (fragmentary) published in this report.

Extremes.--Discharge 1938-65: Maximum observed, 7,750 cfs June 2, 3, 1943; minimum daily, 210 cfs Aug. 25, 26, 1959.
Water temperatures 1949-65: Maximum observed, 74°F July 28, 1960; minimum observed, 32°F Dec. 5-8, 1962, Feb. 27, 1964.

Remarks.--Water temperatures affected by storage in Ennis Lake.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1949-65

55. Madison River below Ennis Lake, near McAllister, Mont. (6-0410)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
9-51	1100	35	27-51	1100	33	3-54	1000	37	27-53	1700	50	21-50	1500	50	26-50	1100	54
31-51	1100	35	28-53	0815	36	28-54	1200	35	6-54	1330	41	1-51	1100	46	9-54	1800	53
4-53	1130	33	4-54	1100	37	4-55	0935	33	28-55	0800	36	23-51	0700	58	16-55	1210	58
4-53	1330	33	1-55	1030	34	31-55	1410	40	4-56	1110	38	25-53	1830	50	5-56	0905	57
27-53	0930	35	7-56	1040	34	7-56	1050	35	16-57	1140	40	1-54	1500	37	19-57	1505	56
10-57	1215	34	8-57	1310	34	13-57	1215	36	23-58	1630	41	18-54	1800	59	25-58	1605	64
14-58	1045	36	20-58	0900	35	19-58	1020	36	29-59	1030	46	25-55	1600	52	10-59	1630	58
22-59	1130	34	25-59	1130	34	1-61	1200	37	11-60	1030	45	2-56	1120	47	24-59	1200	66
4-63	1005	36	2-60	1500	35	7-62	1400	36	5-61	1030	42	14-57	0930	53	11-60	1630	55
29-63	1110	35	1-61	1300	38	28-62	1400	36	27-62	1330	47	15-60	1500	54	5-61	1430	50
3-64	1630	34	1-62	0830	36	28-63	1405	41	26-63	1250	43	26-63	1325	59	2-62	0940	58
28-64	1430	35	26-63	0910	38	26-64	1400	36	27-64	1430	41	25-64	1530	54	24-62	1355	62
6-65	1500	36	27-64	1430	32	26-65	1700	34	27-65	1130	48				2-63	1600	59
26-65	1630	36	24-65	1230	34										22-63	1730	57
															10-64	1630	50
															25-65	1100	59
July			August			September			October			November			December		
24-50	1915	64	7-52	1545	68	16-49	1530	58	1-50	1420	43	2-50	0835	41	2-52	1000	34
3-52	1000	60	12-54	1700	59	2-50	1100	67	23-51	1600	41	29-50	1025	36	28-54	1030	36
8-53	1030	64	25-55	0940	67	27-51	1400	50	10-52	1000	51	27-51	1600	38	13-55	0835	34
8-54	1900	57	8-56	1015	65	7-60	1200	60	13-54	1330	46	6-52	1200	40	17-57	1035	36
13-55	1840	64	14-57	1145	67	8-62	0930	55	6-55	0910	46	17-54	1720	40	18-61	1300	36
11-56	1015	66	20-58	1400	70	29-65	1700	52	16-57	1540	50	5-55	1035	34	7-62	1430	37
10-57	1720	66	27-61	1335	70				8-61	1515	46	29-56	1030	36			
23-58	1200	70	28-63	1330	64				5-62	1000	55	16-57	1720	36			
22-59	1330	70	25-64	1530	58				9-63	1630	57	3-60	1100	41			
28-60	1200	74							6-64	1730	49	14-61	1600	36			
18-61	1430	71							28-65	1500	50	2-62	1400	46			
27-62	1630	68										20-63	1300	36			
26-63	1410	66										17-64	1600	36			
21-64	1400	64															

55. Madison River below Ennis Lake, near McAllister, Mont. (6-0410)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), August to December 1961																																
August																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	68	68	--	64	64	64	64	65	65	65	65	65	64	64	65	65	65	65	64	63	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	66	68	--	62	62	64	63	63	64	63	64	63	63	63	64	64	64	64	63	62	--
September																																
Maximum.....	62	--	--	--	61	62	61	60	60	58	58	56	55	54	54	55	56	--	55	54	52	52	50	50	48	48	48	49	48	46	-	54
Minimum.....	60	--	--	--	59	60	60	59	58	57	56	55	53	52	52	54	54	--	54	52	52	50	50	48	47	47	47	47	46	45	-	53
October																																
Maximum.....	46	46	47	48	--	51	50	50	48	48	48	47	48	48	51	52	--	50	50	49	48	45	44	41	40	39	39	39	38	37	--	44
Minimum.....	44	45	45	46	--	50	50	48	48	48	47	46	46	47	47	50	--	48	47	48	45	44	41	40	38	38	38	38	37	36	--	43
November																																
Maximum.....	37	38	38	37	37	37	--	--	--	35	36	36	36	36	35	35	34	34	34	34	35	37	37	37	37	37	37	37	--	--	--	36
Minimum.....	37	37	37	37	37	37	--	--	--	34	34	36	35	34	35	33	34	34	34	34	34	34	35	37	37	37	37	37	--	--	--	35
December																																
Maximum.....	--	--	--	--	--	34	34	34	35	36	--	--	36	36	36	36	36	36	36	36	--	--	--	--	--	--	--	--	--	--	--	--
Minimum.....	--	--	--	--	--	34	34	34	34	35	--	--	36	35	36	36	36	36	36	36	--	--	--	--	--	--	--	--	--	--	--	--
Water temperatures (°F), calendar year 1962																																
January																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	36	36	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	36	35	--
February																																
Maximum.....	36	36	36	36	36	36	--	37	37	37	37	37	37	--	--	38	37	37	37	37	36	37	--	--	--	--	--	--	-	-	-	--
Minimum.....	35	35	36	36	36	36	--	37	37	37	36	36	36	--	--	37	37	37	36	36	36	36	--	--	--	--	--	--	-	-	-	--
March																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	37	37	37	37	38	38	38	38	38	38	38	38	38	--	--	--	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	36	36	36	37	37	38	38	38	38	37	37	38	--	--	--	--	--
April																																
Maximum.....	--	--	--	--	--	--	40	40	40	42	43	43	43	43	--	--	44	48	52	52	50	50	--	--	--	--	53	51	50	48	-	--
Minimum.....	--	--	--	--	--	--	39	40	40	40	42	42	42	42	--	--	40	44	48	50	48	48	--	--	--	--	52	49	48	48	-	--
May																																
Maximum.....	48	--	--	52	53	53	54	55	56	56	55	55	54	54	54	53	56	57	58	57	56	56	57	57	57	57	56	57	58	59	61	56
Minimum.....	48	--	--	51	52	52	53	54	55	55	54	54	54	53	53	52	53	54	56	55	56	55	56	57	57	56	56	56	57	57	58	54
June																																
Maximum.....	61	61	61	59	57	56	57	58	58	58	59	60	60	60	59	58	60	62	62	63	64	64	64	63	69	69	66	67	67	66	-	62
Minimum.....	58	58	59	57	56	55	55	57	56	56	56	58	59	59	58	57	57	59	58	60	62	62	62	60	60	66	64	63	64	65	-	59
July																																
Maximum.....	66	66	65	65	65	64	63	65	66	66	67	67	66	65	65	66	66	66	66	67	68	68	67	68	68	68	68	68	68	67	67	66
Minimum.....	64	64	64	63	64	62	61	61	64	64	65	65	65	64	64	64	65	64	63	64	65	65	65	65	65	68	67	66	67	66	66	64
August																																
Maximum.....	68	68	69	69	68	66	67	68	68	68	67	67	68	69	69	69	70	69	69	70	70	69	66	66	65	66	66	64	62	60	61	67
Minimum.....	66	66	67	68	66	64	65	66	66	66	66	65	67	66	66	68	68	68	68	68	68	66	64	64	64	64	64	62	60	58	58	65
September																																
Maximum.....	62	62	60	59	60	62	62	60	57	57	56	55	55	55	55	57	57	58	59	59	60	60	59	--	--	--	61	60	59	58	-	59
Minimum.....	60	60	58	58	58	58	60	57	55	56	55	55	55	54	54	54	56	56	57	58	59	58	58	--	--	--	59	58	57	56	-	57

55. Madison River below Ennis Lake, near McAllister, Mont. (6-0410)

Water temperatures (°F), calendar year 1962--Continued

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum.....	57	56	56	56	55	54	54	53	52	51	50	50	50	50	49	49	49	49	49	50	48	49	--	--	--	--	--	50	49	49	48	51
Minimum.....	56	55	55	55	54	53	52	52	51	50	49	50	50	49	48	48	48	48	48	48	47	48	--	--	--	--	--	48	48	48	48	50
November																																
Maximum.....	48	48	48	49	48	47	46	43	43	42	42	40	40	40	40	41	40	--	38	36	37	37	36	35	34	35	35	35	--	--	-	41
Minimum.....	48	48	47	46	47	46	43	42	42	42	40	40	40	40	40	40	40	--	35	35	36	36	35	34	34	34	35	35	--	--	-	40
December																																
Maximum.....	--	34	34	34	33	33	33	33	34	34	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum.....	--	34	34	33	32	32	32	32	33	34	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1961	Max	--	--	--	--	--	--	--	--	62	62	52	38	36
	Min	--	--	--	--	--	--	--	--	45	36	33	34	
1962	Max	--	38	38	53	61	69	68	70	62	57	49	--	
	Min	--	35	--	39	38	55	61	58	54	48	34	32	

56. Madison River at Three Forks, Mont.

Location.--At thermograph site, lat 45°54'05", long 111°31'30", in N½ sec.30, T.2 N., R.2 E., on left bank about 450 ft downstream from old bridge on U. S. Highway 10, 1 mile northeast of Three Forks. Altitude of gage is 4,060 ft (from topographic map).

Drainage area.--2,531 sq mi.

Water temperature records available.--Thermograph record during period August to December 1962 published in this report.

Extremes.--Discharge 1893-97, 1928-32, 1941-50: Maximum observed, 8,175 cfs June 19, 1896; minimum observed, 416 cfs Feb. 27, 1930.

Water temperatures 1962: Maximum, 72°F Aug. 16, 1962; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.

Water temperatures (°F), August to December 1962

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
August																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	71	72	70	72	74	71	67	69	70	73	70	66	--	--	--	--	--	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64	64	64	60	62	64	61	59	59	63	62	58	--	--	--	--	--	--
September																																
Maximum.....	67	65	60	63	66	66	64	56	60	59	56	59	58	61	60	61	62	62	63	62	61	62	62	--	--	--	61	61	59	58	-	61
Minimum.....	57	58	54	53	55	56	56	50	50	52	53	52	52	52	53	52	52	54	56	55	57	54	55	--	--	--	55	56	54	51	-	54
October																																
Maximum.....	59	58	59	58	57	55	55	53	53	51	52	53	53	52	49	50	50	50	51	50	51	50	50	49	49	49	50	50	50	50	50	52
Minimum.....	52	52	53	54	54	52	50	50	50	50	49	50	50	49	47	46	45	46	47	46	48	46	46	46	45	44	46	46	46	46	45	48
November																																
Maximum.....	49	49	48	48	47	45	44	44	44	45	42	43	43	42	42	41	40	--	--	39	35	35	35	35	38	40	41	40	38	--	-	42
Minimum.....	45	44	44	43	45	43	40	41	42	42	39	41	40	40	40	38	36	--	--	35	33	33	33	32	35	37	38	37	35	--	-	39
December																																
Maximum.....	--	37	37	34	34	36	36	38	36	34	33	33	--	--	--	38	38	38	38	36	37	36	33	33	--	--	--	--	--	--	--	--
Minimum.....	--	32	34	32	32	33	33	36	32	32	32	32	--	--	--	36	35	36	35	35	35	33	32	32	--	--	--	--	--	--	--	--

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max	--	--	--	--	--	--	--	72	67	59	49	38
	Min	--	--	--	--	--	--	--	58	50	44	32	32

57. Taylor Creek near Grayling, Mont. (6-0430)

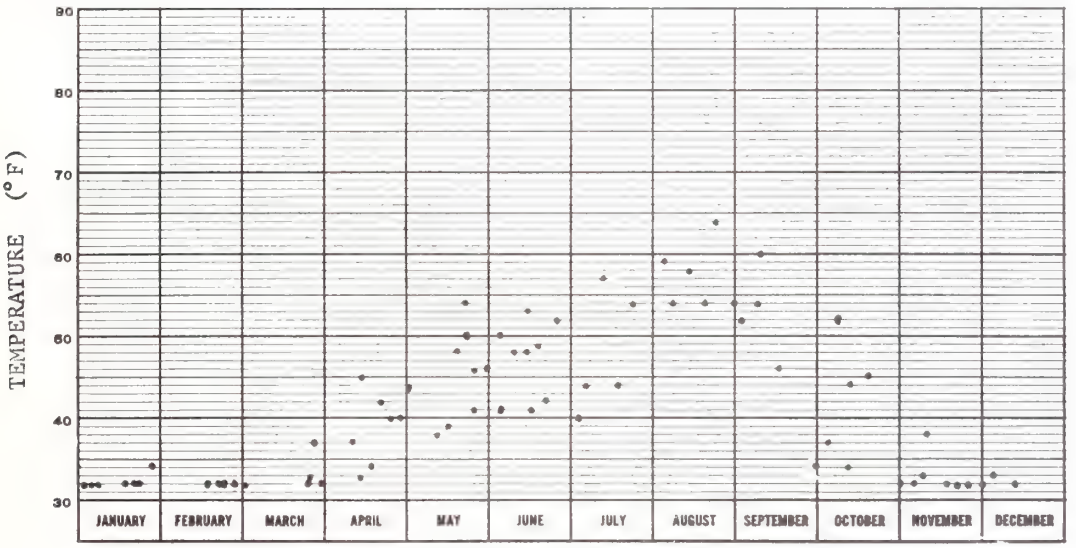
Location.--At gaging station, lat 45°04'15", long 111°12'15", in NW¼NW¼ sec.11, T.9 S., R.4 E., on right bank half a mile upstream from mouth and 17 miles north of Grayling. Altitude of gage is 6,600 ft (by barometer).

Drainage area.--98.0 sq mi.

Water temperature records available.--74 spot observations made at time of discharge measurements during periods February 1949 to November 1953, April 1955 to September 1957.

Extremes.--Discharge 1946-53, 1955-57: Maximum, 1,020 cfs June 6, 1952; minimum recorded, 7.4 cfs Oct. 29, 1956.

Water temperatures 1949-53, 1955-57: Maximum observed, 64°F Aug. 23, 1955; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1955-57

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-52	1700	32	28-49	1430	32	31-49	1600	32	13-49	1500	37	17-49	1330	39	15-49	1000	41
30-52	1400	34	27-50	1000	32	1-51	0915	32	28-49	1330	42	20-50	1600	48	21-50	1430	52
2-53	1300	32	24-56	1500	32	28-53	1330	37	30-50	1730	40	31-50	1300	46	4-52	1025	41
28-53	1245	32	27-57	1330	32	29-56	1215	33	29-53	1300	40	23-51	1530	54	12-53	1520	48
26-56	1440	32				28-57	1140	32	20-55	1430	33	1-52	1415	44	16-53	0700	49
3-57	1530	32							18-56	1445	45	26-53	1500	46	15-55	0930	41
28-57	1500	32							25-57	1330	34	24-55	1615	41	13-56	1700	53
												23-56	1450	50	4-57	1655	50
												15-57	1025	38	8-57	1535	48
															20-57	1240	42
July			August			September			October			November			December		
25-50	1100	54	22-51	1300	54	1-50	1105	54	14-51	1100	44	26-49	1700	32	2-51	1300	33
2-52	1005	40	6-52	1550	59	30-50	1515	34	9-52	0900	34	1-50	1120	32	1-52	1130	32
7-53	1000	44	23-55	1645	64	4-51	1500	60	6-53	1600	52	29-50	1720	32	14-55	1400	32
13-55	0830	44	7-56	1415	54	4-52	1430	54	5-55	1010	37	5-52	1230	33			
10-56	1430	57	13-57	1310	58	2-53	1530	52	17-56	1500	45	5-53	1000	38			
11-57	1415	57				17-57	1900	46				4-55	1030	32			
												28-56	1100	32			

58. Gallatin River near Gallatin Gateway, Mont. (6-0435)

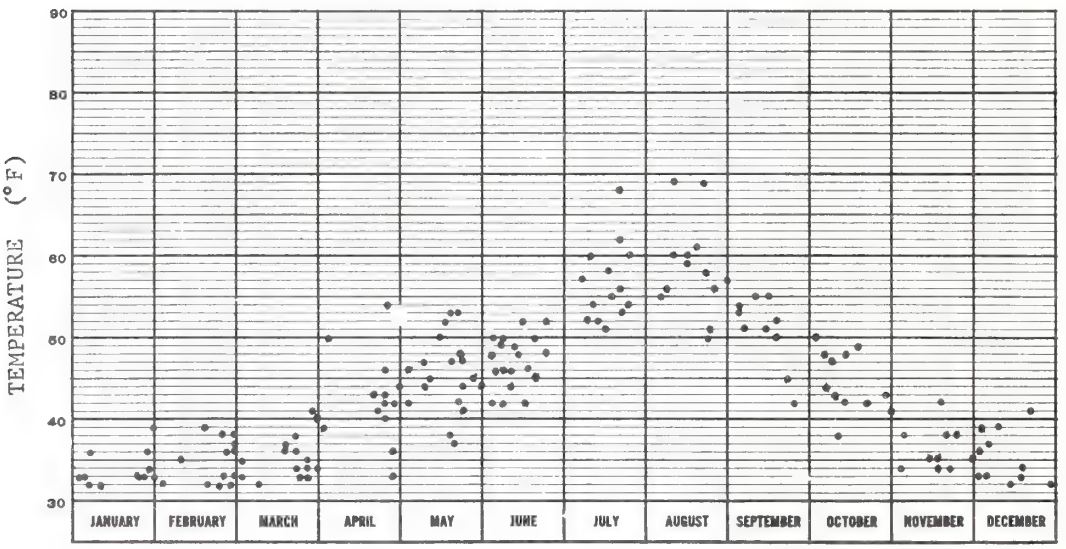
Location.--At gaging station, lat 45°29'50", long 111°16'10", in SE¼SE¼ sec.7, T.4 S., R.4 E., on left bank a quarter of a mile downstream from Spanish Creek, 7½ miles south of Gallatin Gateway, and at mile 42.5. Datum of gage is 5,167.7 ft above mean sea level, datum of 1929, supplementary adjustment of 1940.

Drainage area.--825 sq mi.

Water temperature records available.--166 spot observations made at time of discharge measurements during period March 1949 to December 1965. Once-daily observations August 1956 to September 1957 at site 3½ miles downstream published in reports of the Geological Survey.

Extremes.--Discharge 1889-94, 1930-65: Maximum observed, 8,060 cfs June 20, 1892, June 2, 1894; minimum, 117 cfs Jan. 19, 1935.

Water temperatures 1949-65: Maximum observed, 69°F Aug. 13, 1957, Aug. 22, 1958; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1956	Max	--	--	--	--	--	--	--	--	52	50	41	40
	Min	--	--	--	--	--	--	--	46	43	33	32	32
1957	Max	33	38	41	47	48	51	63	69	64	--	--	--
	Min	32	32	32	35	37	43	46	50	43	--	--	--

58. Gallatin River near Gallatin Gateway, Mont. (6-0435)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-51	1200	33	11-52	1450	35	2-49	1200	35	28-49	1100	42	17-49	1630	38	15-49	1630	52
10-52	1020	32	18-53	1100	32	30-49	1230	34	20-53	1025	43	2-50	1230	42	5-50	1100	42
22-53	1055	33	28-54	1400	37	8-50	1000	32	29-54	1630	36	19-50	1300	37	20-50	1500	50
26-56	1040	33	3-55	1540	32	1-51	1435	33	26-55	1455	43	8-52	1525	44	3-52	1105	48
31-61	1630	39	28-55	1010	33	17-52	0950	37	27-56	1300	40	18-53	1045	47	17-52	1100	46
30-62	1430	34	24-56	0915	32	17-53	1010	36	2-57	1500	39	17-54	1830	52	12-53	1300	44
2-63	0845	33	17-58	1730	39	29-54	1530	35	24-58	1430	41	19-54	2000	53	8-54	1830	50
31-63	1330	33	26-59	1400	38	29-55	1550	33	3-61	1630	50	24-55	1235	41	14-55	1815	48
5-64	1600	32	28-61	1300	36	29-56	0835	34	26-61	1530	42	23-56	1025	42	13-56	1345	49
29-64	1400	34	27-62	1300	32	20-58	1530	38	29-62	0900	33	10-57	1100	47	4-57	1225	46
7-65	1530	36	28-63	1530	38	30-60	1330	41	25-63	1205	46	15-58	1630	50	8-57	1130	46
27-65	1630	36	26-64	1430	33	31-62	1330	40	28-64	1700	54	22-58	1300	53	4-58	1500	48
			26-65	1030	36	26-63	1030	36	30-65	1030	44	2-60	1630	46	5-59	1030	50
						27-64	1430	34				12-60	1400	45	9-59	1830	50
						27-65	1630	33				26-61	1400	48	11-60	1300	46
												27-61	1700	48	7-61	2000	49
												31-62	0925	44	27-62	1415	52
												24-63	1130	44	23-63	1330	45
												29-63	1305	45	3-64	1900	49
												22-64	1700	47	8-64	1430	42
															24-64	1030	48
															15-65	1500	42
July			August			September			October			November			December		
27-50	1715	54	20-49	1705	61	5-51	1100	54	31-50	1530	41	26-49	1300	38	2-51	1600	36
15-52	1020	51	31-50	1530	57	20-51	1625	45	14-51	1600	48	30-50	1100	35	18-52	1045	34
9-53	1115	52	7-52	1220	56	9-52	1120	51	14-52	1350	42	18-52	1110	35	30-54	0825	32
7-54	1700	57	6-53	1030	55	16-53	1030	52	7-53	1000	44	3-53	1200	38	14-55	1550	32
12-55	1635	54	11-54	1700	60	13-56	1400	51	12-54	1100	38	16-54	1325	42	11-56	1230	39
11-56	1500	60	23-55	1350	58	17-57	1730	50	4-55	1535	48	3-55	1625	34	2-57	1700	39
19-57	1430	55	14-56	1505	60	10-58	1530	55	17-57	1630	49	20-58	1330	38	22-58	1630	41
17-58	1330	58	14-57	1530	59	15-59	1300	55	21-60	1130	42	15-61	1430	35	7-59	1530	37
22-59	1930	68	22-58	1200	69	5-62	1300	53	11-61	1815	43	22-63	1500	34	19-61	1300	33
27-60	1730	60	24-60	1530	50	27-65	1615	42	2-62	1330	50	18-64	1530	34	5-62	0900	33
21-61	1635	62	27-63	1800	56				30-62	1330	43				1-65	1545	33
25-62	0800	53	26-64	1600	51				9-63	1000	47						
24-63	0915	56							7-64	1500	47						
22-64	1500	62															
13-65	1515	52															

59. East Gallatin River at Bozeman, Mont. (6-0480)

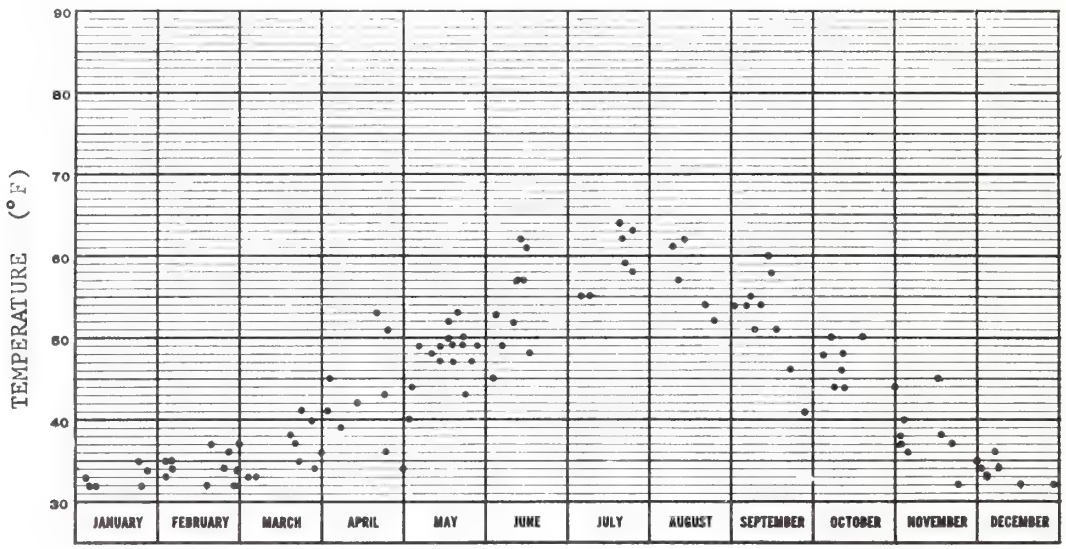
Location.--At gaging station, lat 45°42'00", long 111°01'45", near center of south line of sec.31, T.1 S., R.6 E., on left bank 100 ft upstream from highway bridge, 500 ft downstream from Bozeman Creek, half a mile upstream from Bridger Creek, and half a mile north of Bozeman. Datum of gage is 4,701.6 ft above mean sea level, datum of 1929, unadjusted.

Drainage area.--148 sq mi.

Water temperature records available.--107 spot observations made at time of discharge measurements during period February 1949 to October 1961.

Extremes.--Discharge 1939-61: Maximum, 1,240 cfs June 4, 1953; minimum, 12 cfs Dec. 9, 1944, Mar. 24-26, 1955.

Water temperatures 1949-65: Maximum observed, 64°F July 17, 1952; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

59. East Gallatin River at Bozeman, Mont. (6-0480)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-51	1735	32	28-49	1630	34	29-49	1630	40	14-49	1530	42	18-49	1030	41	14-49	1500	61
24-53	1040	35	7-52	1540	35	7-50	1000	33	27-49	1630	51	2-50	1700	40	13-52	1355	57
7-54	1030	33	17-53	1200	32	3-51	1305	33	21-53	1520	53	17-50	1730	50	4-53	1130	45
24-56	1700	32	5-54	1100	35	19-52	1420	38	30-54	1300	34	14-52	1420	49	11-53	1230	57
9-58	1730	32	28-54	1730	34	23-53	0935	35	25-55	1815	43	22-52	0835	43	8-54	1130	49
28-59	1430	34	3-55	1025	33	29-55	1035	34	24-56	1100	36	14-43	1430	47	14-55	0830	48
			27-55	1150	32	28-56	1400	41	2-57	1800	41	27-53	1100	47	12-56	1935	62
			23-56	1115	34	20-58	1900	37	9-59	1930	39	29-53	1605	49	4-58	1800	53
			18-58	1100	37	31-60	1130	36	4-61	0830	45	17-54	1330	47	11-60	0900	52
			26-59	1630	36							23-55	1700	50			
			8-60	1430	34							22-56	1320	53			
			28-61	1600	37							9-57	1900	49			
												15-58	1900	52			
												19-59	1830	49			
												2-60	1030	44			
												12-60	1830	48			
												27-61	0900	49			
July			August			September			October			November			December		
27-50	1230	63	14-52	1420	62	28-50	0930	41	31-50	1035	44	30-50	1530	35	7-51	1630	36
17-52	1600	64	13-53	0935	57	6-51	1030	54	13-51	1400	48	1-51	1600	37	3-52	1505	33
20-53	1150	62	10-54	1730	61	21-51	1100	46	8-52	1600	50	17-52	1505	38	2-53	0900	34
7-54	0930	55	23-55	0830	54	17-52	1130	51	8-53	0900	44	25-52	0910	32	30-54	1640	32
12-55	0940	55	25-60	1530	52	14-53	1405	60	11-54	1600	44	4-53	0900	36	15-55	1130	32
27-60	0830	58				8-54	1040	55	4-55	1110	48	15-54	1700	45	7-59	1300	34
22-61	0855	59				13-56	1000	54	18-57	0900	50	3-55	1100	40			
						11-58	0700	51	12-61	1315	46	1-56	1730	38			
						15-59	1630	58				20-58	1600	37			
						1-61	0945	54									

60. Bridger Creek near Bozeman, Mont. (6-0485)

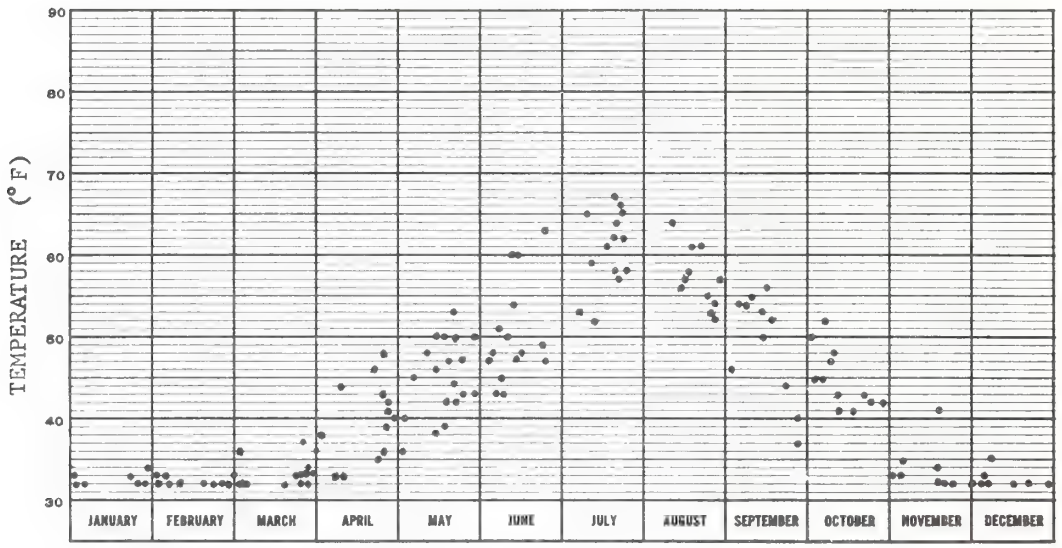
Location.--At gaging station, lat 45°42'20", long 110°57'40", in NE¼SE¼ sec.34, T.1 S., R.6 E., on right bank 3 miles upstream from mouth and 3 miles northeast of Bozeman. Altitude of gage is 4,960 ft (from topographic map).

Drainage area.--62.5 sq mi.

Water temperature records available.--159 spot observations made at time of discharge measurements during period February 1949 to December 1965.

Extremes.--Discharge 1945-65: 902 cfs June 3, 1953; minimum, 0.9 cfs Mar. 23, 1953, Aug. 30, 1954.

Water temperatures 1949-65: Maximum observed, 67°F July 23, 1959; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

60. Bridger Creek near Bozeman, Mont. (6-0485)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-51	1600	32	28-49	1430	33	29-49	1430	33	13-49	0930	33	18-49	0900	39	14-49	1700	60
19-53	1555	33	7-52	1420	32	7-50	1130	32	27-49	1500	48	17-50	1530	50	3-50	1230	47
25-56	0845	32	17-53	1500	32	3-51	1200	32	11-50	1530	44	14-52	1155	46	13-52	1455	54
30-62	1800	34	5-54	1000	32	18-52	1525	32	20-53	1550	46	22-52	1305	42	11-53	1105	50
1-63	1455	33	26-54	1630	32	23-53	1005	33	26-55	0915	36	14-53	1115	38	24-53	1410	47
5-64	0930	32	3-55	0900	32	26-54	1600	32	24-56	0920	35	27-53	0955	43	8-54	1000	45
28-64	1800	32	27-55	1040	32	29-55	0900	33	2-57	1830	38	29-53	0930	43	14-55	1015	47
7-65	0930	32	23-56	0900	32	25-56	1830	32	24-58	1800	43	1-54	1830	36	12-56	1700	60
27-65	0900	32	27-62	1530	32	31-60	1230	36	10-59	0930	32	17-54	1200	42	10-59	0830	43
			1-63	0850	33	27-62	1200	34	26-61	1100	36	23-55	1920	50	10-60	1800	51
			5-63	1100	33	1-63	0910	36	29-62	1400	40	22-56	0855	44	26-61	1500	63
			25-64	1730	32	26-63	1300	37	26-63	0800	39	22-56	1130	44	27-62	1700	63
			26-65	1400	32	26-64	1800	32	28-64	0900	42	9-57	1800	45	24-63	0930	47
						27-65	0930	32	29-65	0900	41	15-58	0800	50	3-64	1300	48
												22-58	1500	53	9-64	1030	43
												19-59	1930	47	25-64	0800	49
												2-60	0900	40	14-65	1700	48
												12-60	0800	48			
												26-61	1900	47			
												30-62	1325	50			
												23-63	1545	53			
												23-64	1100	42			
July			August			September			October			November			December		
26-49	1530	62	30-50	1500	57	28-50	1030	40	11-51	1800	48	30-50	1420	32	7-51	1500	35
26-50	1800	65	14-52	1220	57	6-51	1400	54	8-52	1450	47	1-51	1500	33	3-52	1400	32
17-52	1525	61	13-53	1030	56	21-51	1120	44	8-53	1000	48	17-52	1440	34	2-53	1000	32
20-53	1055	57	20-53	1345	62	17-52	1420	52	11-54	1735	41	4-53	1000	35	30-54	1430	32
7-54	0830	53	10-54	1530	64	14-53	1125	53	4-55	0830	45	16-54	1955	41	15-55	0920	32
12-55	1125	52	23-55	1915	55	8-54	0930	54	16-58	1500	41	3-55	0845	33	7-59	1230	32
10-56	1500	65	14-56	0845	58	13-56	0900	50	20-60	1300	43	4-59	1000	33	20-61	0800	32
23-59	1000	67	25-60	1430	53	17-57	1430	52	12-61	1140	43	16-61	0800	32	5-62	1400	33
27-60	0900	58	27-63	1100	54	11-58	0800	55	2-62	1700	50	23-63	0900	32	2-65	0850	32
22-61	1130	62	26-64	0930	52	15-59	1700	56	30-62	1630	42	18-64	0900	32			
24-62	1330	66	16-65	1700	61	2-61	0840	46	8-63	1400	52						
23-63	1330	64				5-62	1630	54	7-64	0900	45						
22-64	0800	58				28-65	0830	37	25-65	1330	42						
13-65	1600	59															

61. Hyalite Creek at Hyalite ranger station, near Bozeman, Mont. (6-0500)

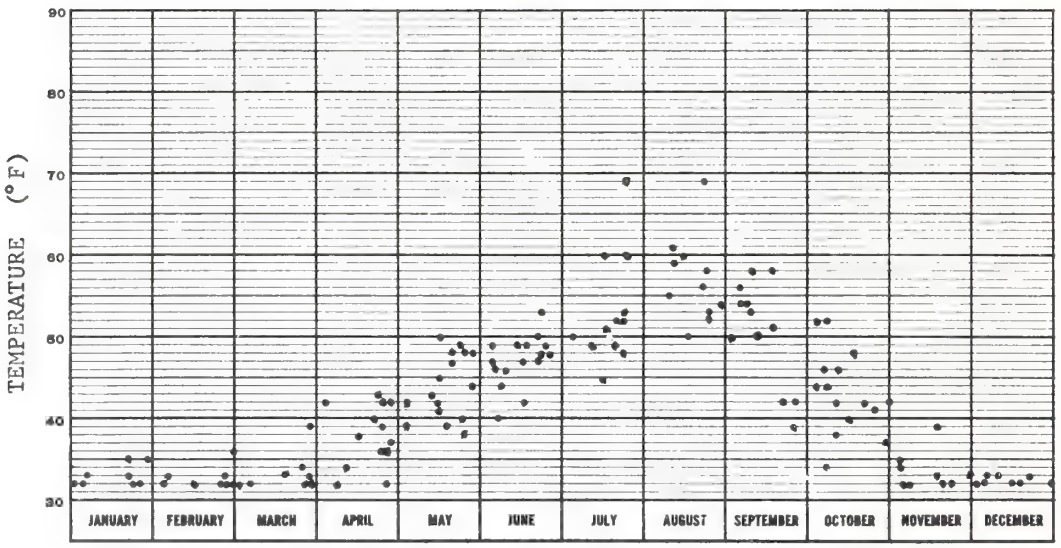
Location.--At gaging station, lat 45°33'40", long 111°04'10", in NW¼SE¼ sec.23, T.3 S., R.5 E., on right bank three-quarters of a mile south of Hyalite ranger station, 7½ miles south of Bozeman, and 20 miles upstream from mouth. Datum of gage is 5,539.6 ft above mean sea level, datum of 1929, supplementary adjustment of 1940.

Drainage area.--48.2 sq mi.

Water temperature records available.--155 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1895-96, 1898-1900, 1902, 1934-65: Maximum observed, 956 cfs June 14, 1898; minimum daily, 5 cfs Jan. 27, 1961.

Water temperatures 1949-65: Maximum observed, 69°F Aug. 22, 1958, July 23, 1959; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

61. Hyalite Creek at Hyalite ranger station, near Bozeman, Mont. (6-0500)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
20-52	1315	33	15-52	1645	32	2-49	0930	32	28-49	0900	36	18-49	1200	39	14-49	1330	49
20-53	1405	35	25-53	1600	32	30-49	0830	32	12-50	1600	34	2-50	0930	39	4-50	1330	49
24-56	1440	32	5-54	1230	32	7-50	1530	32	15-53	1530	38	14-52	0850	41	20-50	1630	50
30-62	1700	35	28-54	1600	32	1-51	1705	32	26-55	1300	36	29-52	1130	44	16-52	1600	49
1-63	1650	32	3-55	1305	32	19-52	1110	33	26-56	1730	39	14-53	1550	42	5-53	1605	47
31-63	1555	32	27-55	1640	32	18-53	1510	33	24-58	1600	40	6-54	1430	45	24-53	1545	48
5-64	1200	32	23-56	1600	32	29-54	1300	32	9-59	1730	32	17-54	1530	45	8-54	1545	46
29-64	0930	32	8-60	1330	33	29-55	1320	33	3-61	1800	42	20-54	1100	48	25-54	1345	53
7-65	1130	33	28-61	1430	32	28-56	1520	32	26-61	1330	42	24-55	0920	38	14-55	1500	47
27-65	1130	32	28-62	1030	32	30-60	1600	39	29-62	1130	37	22-56	1630	49	6-56	1340	46
			28-63	1720	36	29-62	1700	33	25-63	1330	43	15-58	1800	50	9-60	1800	44
			26-64	1000	32	26-63	0835	34	27-64	1800	32	19-59	1630	47	8-61	0930	44
			26-65	1230	33	27-64	1100	32	29-65	1700	42	2-60	1430	42	27-62	1000	48
						27-65	1130	32				13-60	1400	43	23-63	1630	47
												27-61	1400	48	3-64	1530	48
												30-62	1740	48	9-64	0830	40
												23-63	1720	49	25-64	1030	49
												22-64	1900	40	15-65	0930	42
July			August			September			October			November			December		
27-49	1000	48	30-50	1700	54	28-50	1235	39	31-50	1215	37	30-50	0915	33	10-51	1700	33
27-50	1930	53	12-52	1530	61	5-51	1530	54	13-51	1630	46	12-52	1545	32	17-52	1635	32
17-52	1020	51	10-53	1505	55	20-51	1715	42	10-52	1345	44	3-53	1600	35	1-53	1000	32
22-53	0905	49	11-54	1000	59	11-52	1140	53	7-53	1700	46	16-54	1115	39	30-54	1150	32
7-54	1200	50	23-55	1115	56	17-53	1405	51	12-54	0910	38	3-55	1445	34	15-55	1500	32
12-55	1430	49	14-56	1310	60	8-54	1210	54	4-55	1345	44	4-59	1230	32	19-61	1530	33
17-58	1500	60	14-57	1400	60	13-56	1130	50	17-57	1730	48	16-61	1000	34	5-62	1100	33
23-59	1200	69	22-58	1300	69	10-58	1730	58	16-58	1300	40	23-63	1200	32	2-65	1015	32
27-60	1930	52	25-60	1700	53	15-59	1500	58	20-60	1715	42	18-64	1130	32			
24-62	1530	60	27-63	1500	58	1-61	1645	50	12-61	1735	42						
24-63	1510	60	26-64	1200	52	5-62	1500	56	2-62	1500	52						
22-64	1030	52	17-65	0900	50	27-65	1730	42	30-62	1500	42						
14-65	0630	45							8-63	1700	52						
									7-64	1230	34						
									25-65	1500	41						

62 . Gallatin River at Logan, Mont. (6-0525)

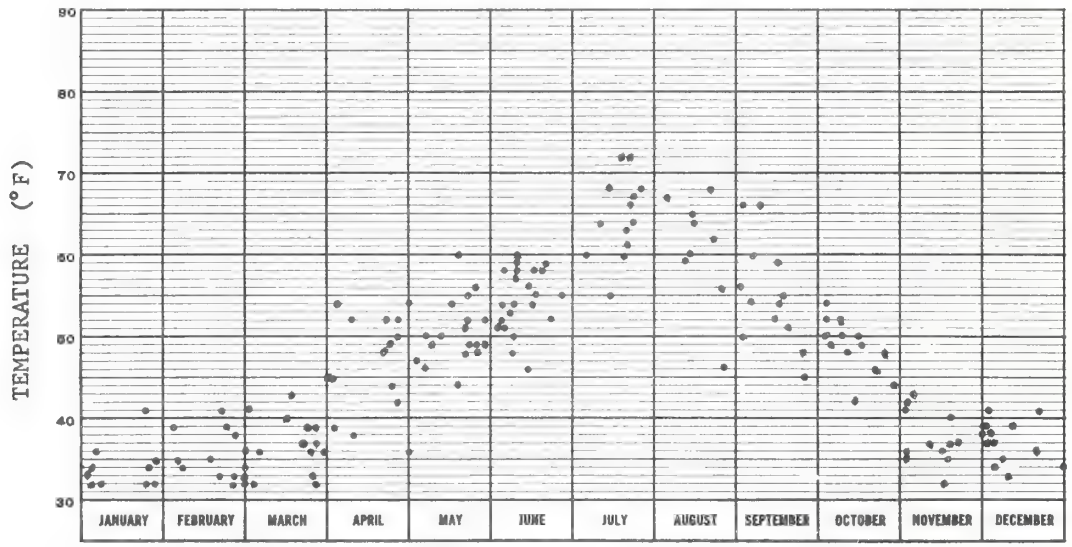
Location.--At gaging station, lat 45°53'10", long 111°26'20", in NE¼ sec.35, T.2 N., R.2 E., on right bank at former county road bridge site, half a mile west of Logan, and 6 miles upstream from mouth. Datum of gage is 4,086.42 ft above mean sea level, datum of 1929, supplementary adjustment of 1962.

Drainage area.--1,795 sq mi.

Water temperature records available.--175 spot observations made at time of discharge measurements during period February 1949 to December 1965. Once-daily observations August 1956 to September 1957 published in reports of the Geological Survey.

Extremes.--Discharge 1893-1905, 1928-65: Maximum observed, 9,840 cfs June 21, 1899; minimum observed, 130 cfs July 19, 1939.

Water temperatures 1949-65: Maximum observed, 72°F July 22, 1957, July 23, 1959, July 20, 1964; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1956	Max	--	--	--	--	--	--	--	66	64	58	44	42
	Min	--	--	--	--	--	--	--	54	54	40	34	32
1957	Max	35	41	44	56	60	62	72	71	64	--	--	--
	Min	32	33	34	42	46	48	57	57	46	--	--	--

62. Gallatin River at Logan, Mont. (6-0525)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
9-51	1715	32	28-49	1200	34	29-49	1130	37	27-49	1230	50	18-49	1600	44	14-49	1100	56
9-52	1135	32	26-51	1730	38	6-50	1700	36	12-50	1630	52	10-50	1300	49	2-50	1700	51
24-53	1430	41	7-52	0955	34	3-52	1515	32	2-52	1300	45	7-52	0935	46	20-50	1100	52
6-54	1530	36	19-53	1130	33	17-52	1500	43	21-53	1310	52	22-53	1320	51	11-51	1300	58
24-56	0930	32	5-54	1800	35	23-53	1440	39	30-54	1030	36	19-54	1600	60	3-52	0850	51
29-59	1130	35	28-54	1130	38	26-54	1400	39	25-55	1515	49	23-55	1320	52	4-52	1335	58
1-63	1150	33	25-55	1630	33	30-55	1020	36	23-56	1550	48	25-56	1200	56	18-52	1335	58
4-64	1600	34	22-56	1535	39	25-56	1435	39	2-57	1300	39	9-57	1530	50	16-53	1745	58
27-64	1730	32	17-58	1500	35	20-58	1330	37	24-58	1230	44	15-58	1400	54	10-54	1630	54
5-65	1720	32	9-60	1130	34	16-60	1600	40	9-59	1030	38	19-59	1230	48	13-55	2000	56
25-65	1700	34	3-61	1530	39	31-60	1530	45	3-61	1430	54	3-60	1100	47	12-56	1525	60
			28-61	1100	36	27-62	0900	36	28-61	1130	52	13-60	1200	50	8-57	1000	53
			28-62	1300	32	1-63	1100	41	28-62	1430	42	28-61	1100	49	4-58	1230	52
			20-63	1330	41	25-63	1010	46	25-63	0850	44	30-62	1115	52	9-59	1530	57
			25-64	1430	32	25-64	1730	32	27-64	1000	42	23-63	1210	55	10-60	1600	58
			24-65	1700	33	25-65	1800	33	30-65	1400	54	30-63	0730	49	28-62	1030	55
												22-64	1100	51	8-63	1500	48
												24-65	1830	49	14-63	1630	54
															19-63	1200	59
															4-64	1400	54
															9-64	1230	50
															16-64	1330	55
															9-65	1610	59
															14-65	1430	46
July			August			September			October			November			December		
26-50	1500	67	5-52	1435	67	2-50	1630	66	11-51	1600	52	12-49	0930	37	1-50	1350	37
22-52	1410	61	13-52	1305	65	27-50	1730	48	17-52	1615	49	2-51	1530	35	3-51	1655	37
13-53	1130	68	12-53	0925	59	1-51	1100	56	8-53	1500	52	19-52	1250	40	10-51	1505	33
6-54	1700	60	10-54	1100	60	20-51	1120	51	11-54	1400	48	4-53	1500	43	19-52	1020	36
11-55	1735	64	14-57	1030	64	18-52	1210	55	3-55	1730	54	30-53	1600	39	31-54	0900	34
17-58	1200	60	22-58	1000	68	15-53	1400	59	17-57	1400	50	15-54	1510	46	11-56	1100	39
23-59	1230	72	24-60	1330	56	7-54	1600	60	21-60	0900	46	2-55	1750	36	2-57	1500	38
28-60	2000	68	27-63	0830	46	13-56	1600	52	13-61	1250	42	1-56	1430	41	22-58	1430	41
23-61	0955	66	24-64	1800	62	17-57	0930	55	2-62	1030	50	20-58	1130	37	8-59	1130	35
24-62	1000	64				10-58	1300	66	30-62	1030	44	3-59	1515	42	4-62	1445	34
23-63	0900	63				16-59	1400	54	8-63	1030	50	30-60	1230	38	2-65	1230	41
20-64	1700	72				2-61	1100	50	5-64	1700	49	16-61	1200	35			
13-65	1200	55				5-62	1000	54	25-65	1100	48	23-63	1530	37			
						27-65	1300	45				17-64	0900	32			

63. Sixteenmile Creek at Ringling, Mont. (6-0530)

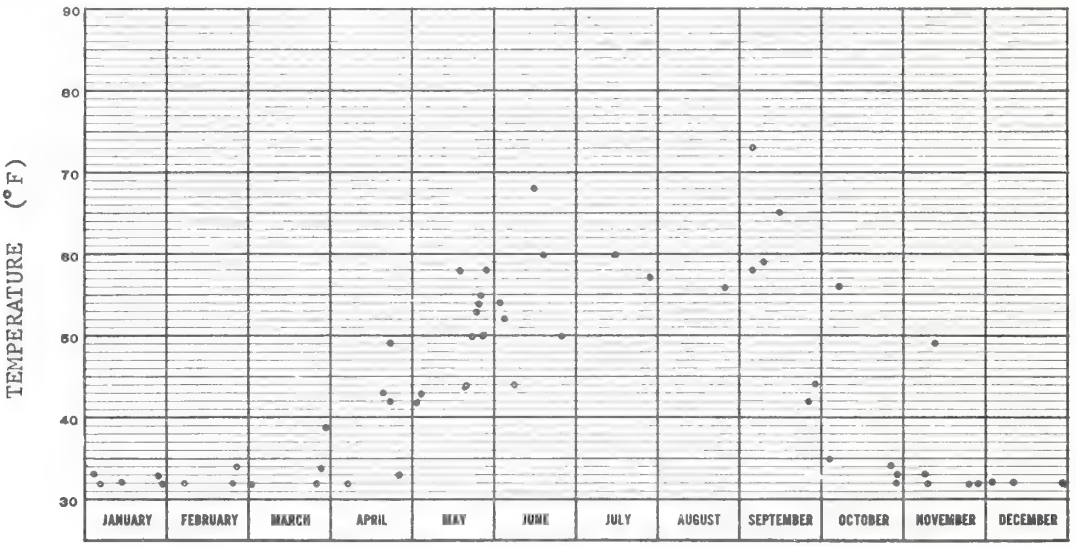
Location.--At gaging station, lat 46°16'20", long 110°48'15", in NE¼NE¼ sec.23, T.6 N., R.7 W., on right upstream abutment of first bridge below highway overpass in Ringling. Altitude of gage is 5,300 ft (from topographic map).

Drainage area.--79.0 sq mi.

Water temperature records available.--56 spot observations made at time of discharge measurements during period September 1950 to June 1955.

Extremes.--Discharge 1950-55: Maximum, 454 cfs Apr. 15, 1952; no flow Aug. 27 to Sept. 3, 1954, Jan. 6 to Mar. 12, Mar. 23-28, 1955.

Water temperatures 1950-55: Maximum observed, 73°F Sept. 3, 1950; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1950-55

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-51	1150	33	26-52	1600	34	1-51	1410	32	8-52	1745	32	17-51	1305	58	5-51	1615	52
7-52	1620	32	25-53	0900	32	28-51	1800	34	18-52	1220	44	29-51	1650	58	18-51	1545	60
29-52	1400	33	10-54	1000	32	27-52	1000	32	19-52	1820	49	3-52	0900	43	26-52	0930	50
31-53	1700	32				30-53	1630	39	22-52	1120	42	22-52	1650	50	2-53	1650	54
13-54	1400	32							25-55	1000	33	24-52	1330	54	8-54	1200	44
												1-53	1200	42	13-55	1335	68
												27-53	1430	55			
												28-53	1130	50			
												19-54	1000	44			
												23-55	1200	53			
July			August			September			October			November			December		
29-52	0830	57	26-51	1825	56	3-50	1530	73	2-50	1530	35	29-50	1125	32	30-52	0930	32
14-54	1230	60				25-51	0825	42	27-51	1730	34	27-51	0830	32	1-53	1000	32
						3-52	1120	58	28-52	0810	32	29-52	1000	32	7-54	1030	32
						29-52	1715	44	6-53	1200	56	12-53	0930	49			
						9-53	1400	59	29-54	1100	33	9-54	1100	33			
						13-54	1245	65				9-54	1130	32			

64. Missouri River at Toston, Mont. (6-0545)

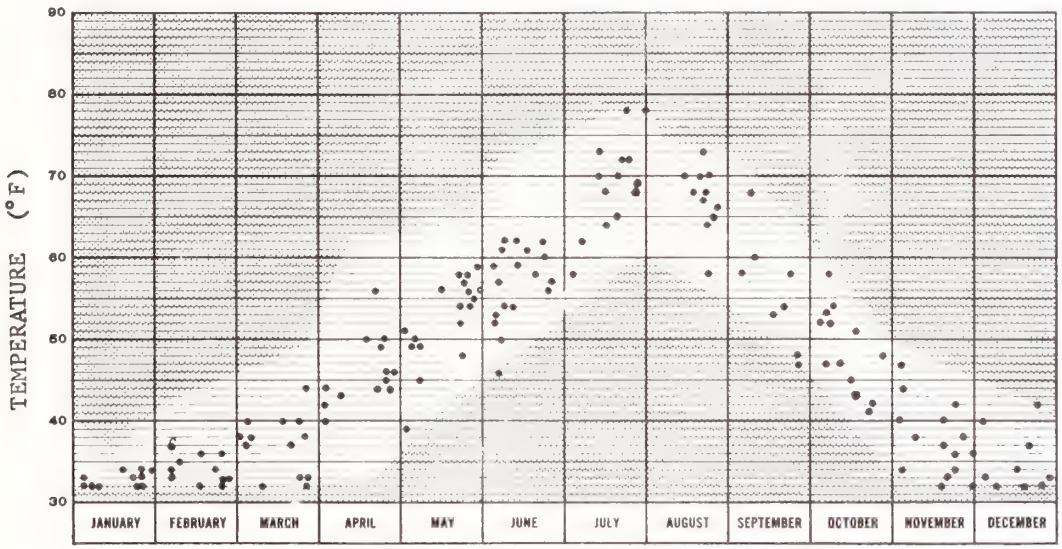
Location.--At gaging station, lat 46°08'45", long 111°25'15", in NW¼ sec.36, T.5 N., R.2 E., on left bank 2 miles southeast of Toston, 4½ miles upstream from Crow Creek, 7 miles downstream from Sixteenmile Creek, and at mile 2,292.0. Altitude of gage is 3,920 ft (from topographic map).

Drainage area.--14,669 sq mi.

Water temperature records available.--162 spot observations made at time of discharge measurements during period March 1949 to December 1965. Once-daily observations May 1949 to June 1953 (fragmentary) at site 2½ miles downstream are published in reports of the Geological Survey.

Extremes.--Discharge 1890-91, 1910-16, 1941-65: Maximum, 32,000 cfs June 6, 1948; minimum, 562 cfs Apr. 30, 1941.
Water temperatures 1949-65: Maximum observed, 78°F July 25, 1949, July 31, 1951, July 23, 1952; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures affected by Toston Dam and Toston Big Spring.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1949-53.

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1949	Max	--	--	--	--	--	68	78	75	66	56	46	--
	Min	--	--	--	--	--	53	63	65	53	34	38	--
1950	Max	--	42	47	55	64	68	73	75	73	56	49	42
	Min	--	32	32	39	42	47	60	65	46	42	32	32
1951	Max	36	42	48	55	62	71	78	74	63	59	42	--
	Min	32	32	32	33	42	51	61	58	49	33	32	--
1952	Max	--	--	49	62	64	72	78	74	69	--	--	--
	Min	--	--	32	40	52	56	62	55	53	--	--	--
1953	Max	--	--	--	--	--	--	66	--	--	--	--	--
	Min	--	--	--	--	--	45	52	--	--	--	--	--

Extremes for years 1949-53

Max	36	42	49	62	64	72	78	75	73	59	49	42
Min	32	32	32	33	42	47	60	55	46	33	32	32

64. Missouri River at Toston, Mont. (6-0545)
Water temperatures at time of discharge measurements

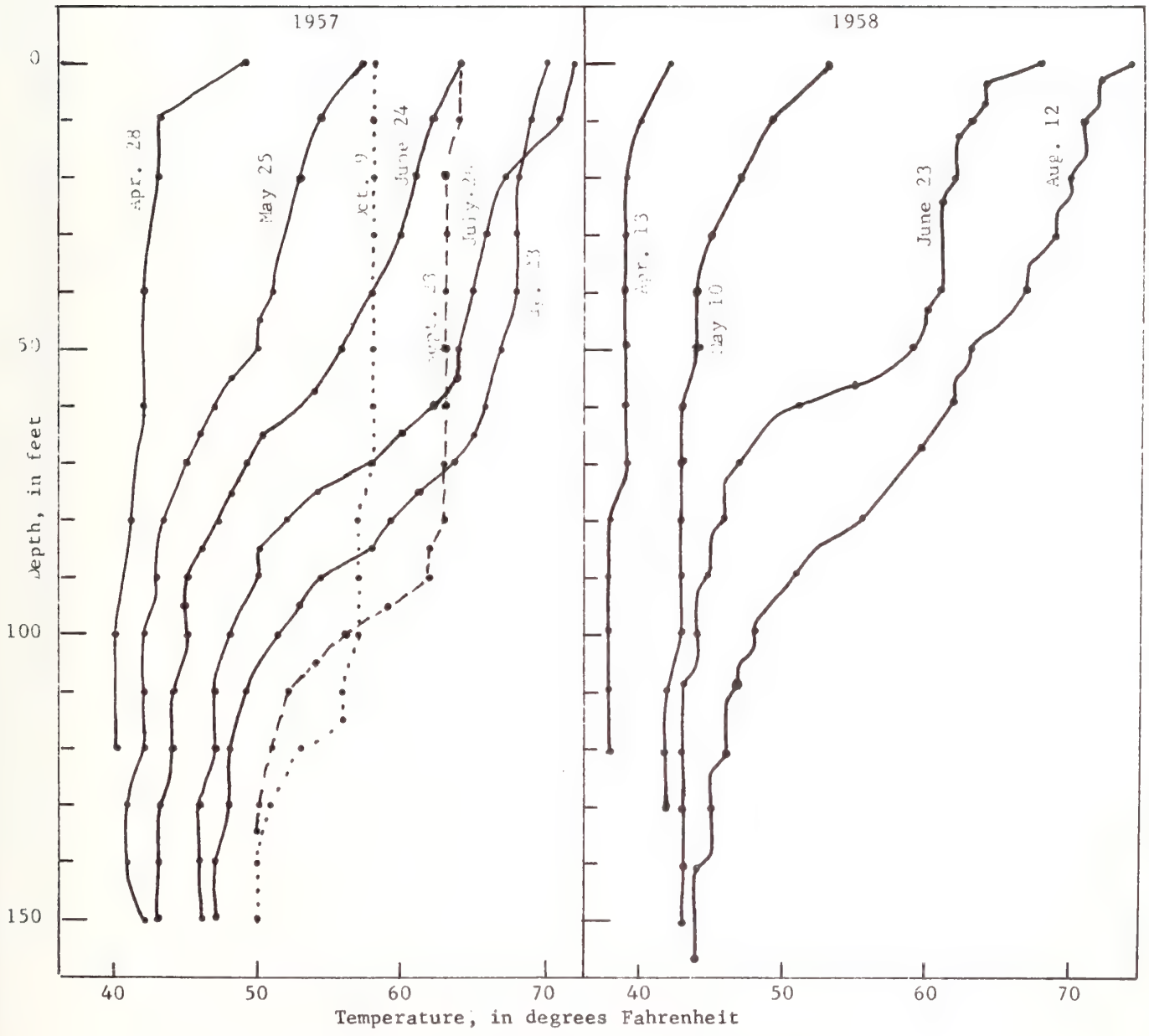
Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-51	1730	32	26-51	1320	33	11-49	1100	32	1-49	1600	40	3-49	1130	51	23-49	1100	60
25-52	1330	32	25-52	1200	32	6-50	1300	38	18-52	1530	50	25-49	1100	54	6-50	1730	57
16-53	1230	34	17-53	1300	32	24-52	1100	33	22-53	1500	56	9-50	1200	45	19-50	1800	58
7-55	1045	32	7-54	1330	34	18-53	1400	40	25-55	1135	50	21-51	1125	58	4-52	1530	59
23-56	1200	33	26-54	1130	36	26-54	1130	38	23-56	1215	44	20-52	1355	54	5-53	1230	52
9-58	1100	32	22-56	1035	34	28-55	1715	33	3-57	1200	40	1-54	1100	39	16-53	1310	61
29-59	1330	34	17-58	1330	37	25-56	1105	40	25-58	1300	45	26-55	1615	55	13-55	1400	62
26-62	1130	34	9-60	1430	35	20-58	1200	37	10-59	1400	43	24-56	1900	58	12-56	1140	62
4-63	1545	33	6-61	1200	37	4-59	1200	40	22-59	1330	44	9-57	1230	49	11-57	1330	54
6-64	1100	32	28-62	1600	33	2-61	1330	37	1-60	1230	42	15-58	1200	56	5-58	1100	53
27-64	1230	32	6-63	1500	33	1-63	1420	38	3-61	1230	44	22-59	1200	52	9-59	1200	54
5-65	1400	32	25-64	1230	32	25-63	1015	44	25-61	1300	46	4-60	1200	50	12-60	1200	59
25-65	1430	33	27-65	1100	33	25-64	1200	32	1-62	1000	44	30-62	0850	56	8-61	1400	62
						25-65	1430	33	30-62	1400	46	22-63	0755	57	23-62	2035	62
									24-63	1240	49	30-63	1700	59	8-63	1130	46
									26-64	1230	43	22-64	1100	56	24-63	1530	56
												4-65	1430	49	9-64	1000	50
												24-65	1400	48	9-65	1800	61
															26-65	1330	57
July			August			September			October			November			December		
7-49	1100	62	24-49	1330	68	27-51	1500	48	22-51	1230	41	17-49	1300	37	26-51	1200	32
13-49	1230	70	29-50	1130	66	26-52	1235	58	23-52	1300	47	27-50	1600	38	15-52	1430	34
18-52	1230	65	26-52	1500	65	3-53	1830	58	9-53	1200	54	19-51	1400	33	7-53	1200	32
2-54	1600	58	22-55	1115	67	11-56	1200	60	14-54	1145	45	21-52	1255	34	16-55	1250	32
14-55	1110	68	3-56	1505	70	23-57	1200	54	3-55	1115	52	9-53	1600	38	2-57	1400	40
24-59	1130	72	21-58	1500	73	10-58	1100	68	17-57	1200	51	23-54	1000	42	22-58	1230	42
29-60	1200	69	19-59	1100	70	16-59	1600	53	16-58	1800	43	2-55	1100	34	20-61	1400	37
14-61	1625	73	24-60	1100	58	30-65	1530	47	12-60	1055	47	1-56	1300	40	4-62	1100	33
28-62	1530	68	26-63	1500	70				7-61	1330	47	30-56	1100	32	2-65	1545	40
22-63	1050	72	24-64	1600	64				6-62	1100	53	21-58	1200	36	30-65	1045	33
20-64	1030	70	16-65	1130	68				7-63	1430	58	3-59	1225	44			
14-65	1430	64							5-64	1430	52	30-61	1000	36			
									29-65	1600	48	3-62	1500	47			
												19-63	1430	40			
												16-64	1500	32			

65. Canyon Ferry Reservoir near Helena, Mont. (6-0585)

Location.--Lat 46°39'00", long 111°43'40", in SE¼SE¼ sec.4, T.10 N., R.1 W., just upstream from Canyon Ferry Dam, 15 miles east of Helena. Elevation of lake at maximum stage, 3,800 ft above mean sea level (levels by Bureau of Reclamation).

Water temperature records available.--Temperature readings obtained on 59 days during summers of 1957 and 1958 and range from single surface observations to complete temperature profiles published in this report.

Cooperation.--Data supplied by Director of Environmental Studies, Montana State University, Bozeman, Mont.



Selected temperature profiles during 1957 and 1958

65. Canyon Ferry Reservoir near Helena, Mont. (6-0585)
Temperatures (°F) 1957

Depth in Feet	Mar.16	Apr.7	Apr.14	Apr.17	Apr.21	Apr.28	May 1	May 5	May 11	May 15
S	33	38	33	34	40	49	48	50	48	49
5										
10		38				43		50		49
15										
20		38				43		47		49
25										
30		40						45		49
35										
40		39				42		45		49
45										49
50		39						44		
55										47
60						42		44		
65										47
70								42		
75										44
80	38	38				41		44		
85										43
90								42		
95										43
100						40		42		
105										43
110								43		
115										43
120						40		43	43	
125										44
130								44		
135										
140										
145										
150										

65. Canyon Ferry Reservoir near Helena, Mont. (6-0585)
Temperatures (°F) 1957

Depth in Feet	May 18	May 22	May 25	June 2	June 8	June 15	June 19	June 24	June 29	July 3
S	56	56	57	65	66	58	64	64	62	67
5				64						66
10		57	54	62	63	58	63	62	60	65
15				54						65
20		57	53	52	60	57	63	61	60	64
25										64
30		56	52	52	58	57	62	60	60	63
35										62
40		55	51	51	54	56	61	58	59	60
45			50							58
50		55	50	51	52	56	60	56	58	54
55			48	50						52
60		54	47	49	51	56	59	53	56	51
65		53	46	47		54	57	50	54	49
70		48	45	45	48	53	54	49	53	48
75		47		44	48	52	51	48	51	47
80		47	43	43	45	51	49	47	49	47
85				43	45	49		46	47	
90		46	43		44	48	46	45	46	46
95				42		46		45		
100		46	42		43	44	45	45	45	46
105				42						
110			42		43	44	44	44	45	45
115				41						
120		46	42		42	44	44	44	44	45
125				41						
130		46	41		42	43	44	43	44	45
135				41						
140		46	41		42	42	43	43	44	45
145				42						
150			42	42	42	42	43	43	43	45

65. Canyon Ferry Reservoir near Helena, Mont. (6-0585)
Temperatures (°F) 1957

Depth in Feet	July 8	July 12	July 17	July 22	July 26	July 31	Aug.5	Aug.9	Aug.14	Aug.19
S	66	70	65	71	72	69	70	71	71	70
5		70								
10	65	69	64	70	71	68	70	70	69	70
15		69								
20	64	67	63	68	67	68	70	68	68	69
25		66								
30	63	66	62	67	66	68	69	68	68	69
35		66								
40	62	66	61	66	65	68	69	67	67	68
45		64	61	66		67				
50	61	63	60	65	64	66	69	66	66	67
55	61	62	59	64	64	66		64	66	
60	60	61	57	62	62	64	67	64	65	67
65	58	54	53	58	60	62	66	63	63	66
70	54	52	53	54	58	58	65	62	61	64
75	53	51	51	52	54	55	64	58	58	63
80	51	51	50	50	52	52	61	57	56	59
85	50	49	49	49	50	51	58	55	54	57
90	48	48	47	49	50	50	53	54	52	55
95	48	47				49	51	51	50	53
100	47	46	46	47	48	48	49	50	49	52
105								49		
110	46	46	46	47	47	47	48	49	48	50
115										
120	45	45	45	47	47	46	46	47	48	48
125										
130	45	45	45	46	46	46	46	47	47	48
135										
140	45	45	45	46	46	46	46	47	47	47
145										
150	45	45	45	46	46	46	46	46	47	47

65. Canyon Ferry Reservoir near Helena, Mont. (6-0585)
Temperatures (°F) 1957

Depth in Feet	Aug.23	Aug.28	Sept.2	Sept.6	Sept.11	Sept.16	Sept.23	Sept.27	Oct. 6	Oct. 9
S	70	68	67	69	66	66	64	64	56	58
5										
10	69	68	67	68	66	66	64	64		58
15										
20	68	68	67	68	66	66	63	63		58
25										
30	68	68	67	67	66	66	63	63		58
35										
40	68	68	67	67	66	66	63	62		58
45										
50	67	67	67	67	66	66	63	61		58
55										
60	66	67	67	67	66	66	63	59		58
65	65	66								
70	64	65	66	67	66	66	63	59		58
75	61	63	65	66	65			59		
80	59	61	61	62	64	65	63	59		57
85	58	59	58	61	62	65	62	59		
90	54	56	56	58	61	63	62	58		57
95	53	54	54	57	59	59	59	58		
100	51	52	53	54	56	57	56	58		57
105		51	52	53	52	54	54	55		
110	49	50	50	51	51	54	52	54		56
115						52		53		56
120	48	49	49	50	50	51	51	51		53
125										
130	48	48	49	49	49	50	50	51		51
135							50			
140	47	48	48	49	49	50		50		50
145										
150	47	47						49		50

65. Canyon Ferry Reservoir near Helena, Mont. (6-0585)
Temperatures (°F) 1958

Depth (feet)	Single Station				Average of Several Stations					
	Apr.13	Apr.27	May 3	May 10	May 18	May 25	May 30	June 7	June 12	June 18
S	42	42	46	53	55	67	65	64	61	67
3					52	67	64	64	61	66
7					51	65	64	64	61	65
10	40	42	46	49	51	62	64	63	61	64
13					50	59	63	62	61	62
16					49	57	62	61	61	61
20	39	42	45	47	49	56	60	60	61	61
23					48	55	59	58	60	61
26					48	53	58	56	58	60
30	39	42	44	45	47	53	56	55	58	60
33					47	52	55	54	57	60
36					47	51	54	53	56	60
39	39	42	43	44	47	51	53	52	55	60
43					46	49	52	50	54	58
46					46	49	51	49	53	55
49	39	42	42	44	46	48	50	48	51	53
52					46	48	49	47	50	52
56					45	47	48	46	49	50
59	39	42	42	43	45	46	47	46	49	49
62					45	46	46	45	48	48
66					45	45	45	45	47	47
69	39	42	42	43	44	45	45	45	47	47
72					44	44	44	44	46	46
75					44	44	44	44	45	46
79	38	41	42	43	44	43	44	44	45	46
82					43	43	43	44	44	46
85					43	43	43	43	44	45
89	38	41	42	43	43	43	43	43	44	45
92					43	42	43	43	44	45
95					42	42	43	43	44	45
98	38	41	42	43	42	42	43	43	44	44
102					42	42	43	43	44	44
105					42	42	43	43	43	44
108	38	41	42	42	42	42	42	42	43	44
112					42	42	42	42	43	44
115					42	42	42	42	43	44
118					42	42	42	42	43	44
121	38	41	42	42	42	42	42	42	43	44
125					42	42	42	42	43	44
128					42	42	42	42	43	43
131		41	42	42	42	42	42	42	42	43
135					42	42	42	42	42	43
138							42	42	42	43
141		40					42	42	42	43
144							42	42	42	43
148							42	42	42	43
151							42	42	42	43
154									42	42
157										42

65. Canyon Ferry Reservoir near Helena, Mont. (6-0585)

Temperatures (°F) 1958

Depth (feet)	(Single Station) June 23	June 28	July 2	July 9	July 16	July 30	Aug. 12	Aug. 20	Aug. 27
S	68	68	64	65	68	67	74	73	72
3	64	67	64	64	65	67	72	71	72
7	64	67	64	64	64	67	72	71	72
10	63	67	64	64	63	67	71	71	72
13	62	67	64	64	63	67	71	70	71
16	62	67	63	64	63	67	71	70	71
20	62	66	63	63	62	67	70	69	70
23	61	66	63	63	62	67	70	68	69
26	61	66	63	63	62	67	69	67	68
30	61	66	62	63	62	66	69	67	68
33	61	65	62	62	62	66	68	66	67
36	61	64	61	62	62	65	67	66	67
39	61	63	60	62	62	65	67	65	66
43	60	62	60	62	62	64	66	64	66
46	60	61	58	61	61	64	65	64	65
49	59	61	57	62	61	63	63	63	65
52	58	56	55	59	61	63	63	62	64
56	55	51	52	57	60	63	62	62	64
59	51	49	51	54	60	62	62	61	63
62	49	49	49	52	57	59	61	61	62
66	48	48	49	50	53	56	60	60	62
69	47	47	48	49	50	54	59	59	60
72	46	46	48	48	49	53	58	58	59
75	46	46	47	48	48	51	57	57	58
79	46	46	47	48	48	50	56	56	57
82	45	45	46	47	47	49	54	54	55
85	45	45	46	47	47	48	52	52	54
89	45	45	45	46	46	48	51	51	52
92	44	45	45	46	46	47	50	50	51
95	44	44	45	46	46	47	49	49	50
98	44	44	45	46	45	46	48	48	49
102	44	44	44	45	45	46	48	48	48
105	44	44	44	45	45	46	47	47	48
108	43	44	44	44	44	45	47	47	47
112	43	44	44	44	44	45	46	47	47
115	43	43	44	44	44	45	46	46	47
118	43	43	44	44	44	44	46	46	46
121	43	43	43	44	44	44	46	46	46
125	43	43	43	44	44	44	45	46	46
128	43	43	43	43	44	44	45	45	45
131	43	43	43	43	44	44	45	45	45
135	43	43	43	43	44	44	45	45	45
138	43	43	43	43	43	44	45	45	45
141	43	43	43	43	43	44	44	45	45
144	43	43	43	43	43	44	44	45	45
148	43	43	43	43	43	44	44	45	45
151	43	43	43	43	43	44	44	45	
154		43		43	43	44	44		
157		43		43	43	44	44		

66. Prickly Pear Creek near Clancy, Mont. (6-0615)

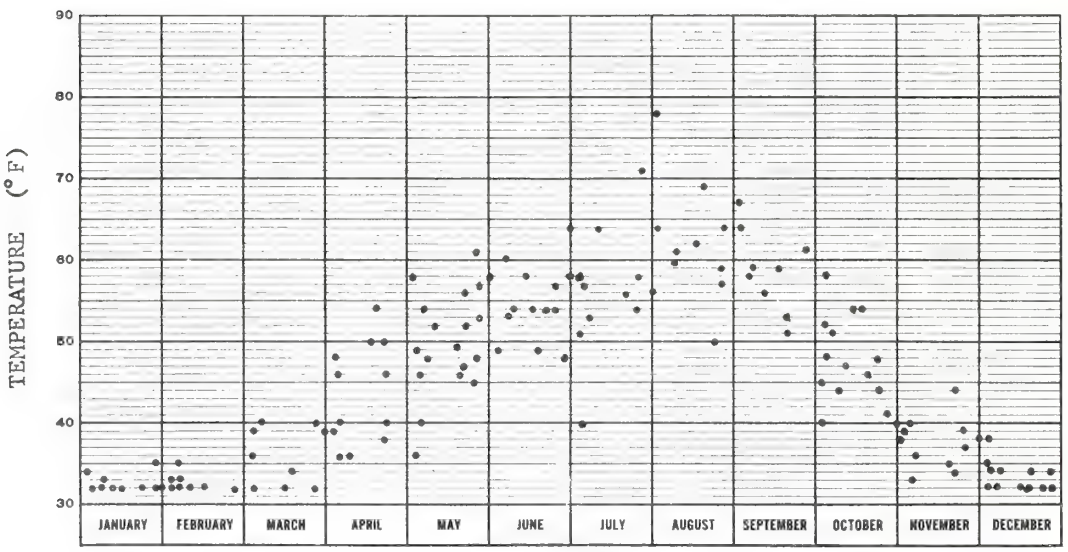
Location.--At gaging station, lat 46°31'05", long 111°56'45", in NE¼SW¼ sec.23, T.9 N., R.3 W., on right bank 100 ft upstream from bridge on U. S. Highway 91, 3½ miles downstream from Lump Gulch Creek, 4 miles northeast of Clancy, 7 miles southeast of Helena, and at mile 26.5. Datum of gage is 4,067.1 ft above mean sea level, datum of 1929.

Drainage area.--192 sq mi.

Water temperature records available.--150 spot observations made at time of discharge measurements during periods May 1949 to October 1953, October 1954 to December 1965.

Extremes.--Discharge 1909-16, 1921-33, 1945-53, 1954-65: Maximum, about 900 cfs June 9, 1927; minimum, 0.5 cfs Jan. 26, 1958.

Water temperatures 1949-53, 1954-65: Maximum observed, 78°F Aug. 1, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1954-65

66. Prickly Pear Creek near Clancy, Mont. (6-0615)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
20-50	1030	32	8-51	1300	32	29-51	1630	40	17-51	1700	50	20-49	1500	46	9-49	0920	53
9-52	1000	32	7-52	1230	33	5-52	1700	32	22-52	0910	38	23-50	1630	52	30-49	1430	58
15-53	1330	32	15-53	1300	32	27-52	1700	32	10-53	1030	36	21-52	1600	47	30-50	1600	64
7-55	1615	32	8-55	1500	35	9-53	1630	40	23-53	0830	40	25-53	1145	45	29-53	1230	48
13-60	1600	32	9-60	1530	32	15-55	1040	32	6-55	1345	40	4-55	1350	49	21-55	1130	54
30-62	1500	32	3-61	0940	32	19-59	1030	34	23-56	1435	46	20-55	1430	56	25-56	1000	57
2-63	1500	32	4-63	1615	33	15-60	1500	32	7-58	1100	40	18-56	1030	49	17-57	1420	54
16-63	1230	32	11-63	1430	32	31-60	1200	39	23-59	1430	50	29-56	1330	57	3-58	0930	49
21-63	1500	32	26-64	1125	32	2-61	1440	36	3-62	1600	48	6-57	0930	46	13-61	1630	58
2-64	1105	34				4-63	1200	32	19-62	1600	54	31-57	1400	58	8-64	1615	60
31-64	1100	32				4-65	1600	39	3-63	1100	39	7-58	1500	48	16-64	0915	49
11-65	1000	33							6-64	1700	36	26-59	0930	45	10-65	1030	54
29-65	1615	35							4-65	1600	46	11-60	1300	52	26-65	1430	54
												1-61	1555	58			
												25-61	1505	61			
												25-62	1500	48			
												7-63	1630	54			
												27-63	1230	53			
												3-64	1330	36			
												19-64	0900	47			
												7-65	1100	40			
July			August			September			October			November			December		
8-49	0930	53	1-50	1100	56	1-49	1430	67	4-50	1600	48	30-49	1200	38	26-50	1100	32
29-62	1600	71	27-52	1030	57	19-51	1030	51	25-51	1530	41	21-50	1530	35	28-50	1500	34
24-53	1130	54	19-53	1420	69	25-52	1600	61	22-52	1530	44	23-52	1440	37	5-51	1600	34
7-55	1145	40	1-56	1100	64	2-55	1605	64	19-54	1340	46	23-54	1625	44	28-52	1700	32
10-58	1700	64	27-56	1130	59	3-57	1200	58	12-55	1215	47	22-55	1430	34	21-55	1440	32
27-59	2000	58	8-57	1200	61	12-58	1000	56	31-56	1230	40	5-57	1030	33	7-59	1430	34
19-60	0600	56	13-58	1200	62	15-61	1600	59	9-57	0930	44	3-59	1100	40	5-60	1530	32
3-62	0800	51	28-59	1400	64	17-63	1215	53	13-58	1600	54	24-61	1530	39	20-61	1005	34
6-62	0900	57	26-60	1000	50	8-64	1430	59	1-59	0930	40	2-62	1000	39	3-62	1600	35
3-63	1100	58	1-61	1555	78				3-60	1610	58	26-63	1130	39	27-62	1600	32
			8-63	1010	60				16-61	1610	54	9-64	0900	36	7-64	1000	32
									8-62	1400	51	1-65	1130	38	19-64	1145	32
									22-63	0820	48				3-65	1430	33
									5-64	1400	52						
									5-65	1200	45						

67. Tenmile Creek near Rimini, Mont. (6-0625)

Location.--At gaging station, lat 46°31'30", long 112°15'20", in SW¼NE¼ sec.20, T.9 N., R.5 W., on left bank at Moose Creek ranger station, 500 ft upstream from Moose Creek and 3 miles north of Rimini. Altitude of gage is 4,850 ft (from topographic map).

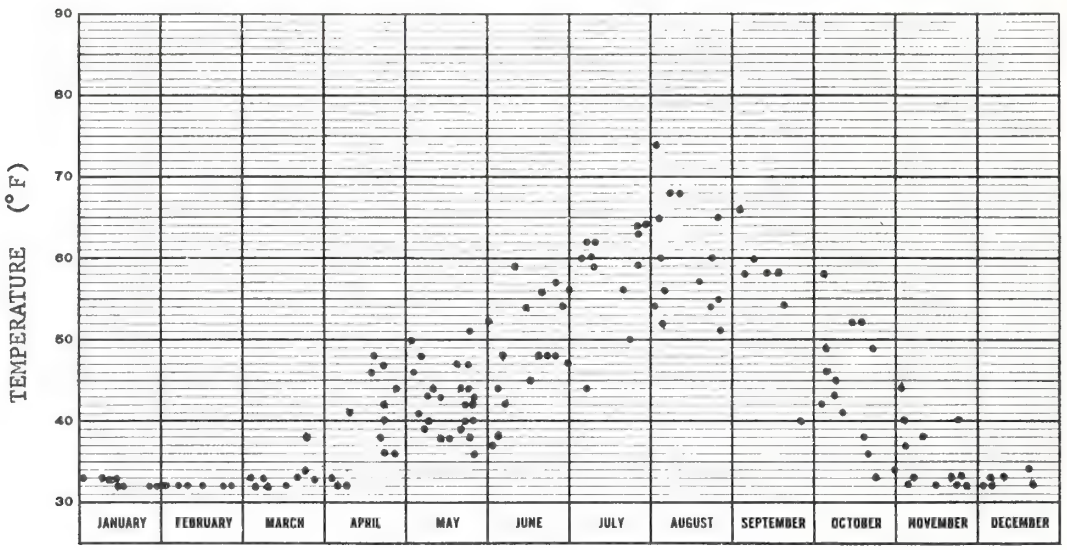
Drainage area.--32.7 sq mi.

Water temperature records available.--160 spot observations made at time of discharge measurements during period May 1949 to December 1965.

Extremes.--Discharge 1914-65: Maximum, 781 cfs May 27, 1917; no flow at times.

Water temperatures 1949-65: Maximum observed, 74°F Aug. 1, 1961; minimum, freezing point on many days during winter months.

Remarks.--Flow may be completely depleted during summer months.



Spot observations of water temperatures, 1949-65

67. Tenmile Creek near Rimini, Mont. (6-0625)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-52	1600	32	8-51	1600	32	6-52	1100	32	10-50	1130	34	20-49	1030	39	9-49	1300	59
13-53	1530	33	13-53	1330	32	27-52	1600	34	17-51	1500	46	15-50	1200	38	30-49	1100	47
12-54	1500	33	1-54	1330	32	9-53	1150	32	21-52	1500	42	23-50	1300	38	22-50	1630	48
10-55	1430	33	25-54	1100	32	22-54	1500	38	28-52	1430	44	3-51	1530	46	25-52	1100	48
14-60	1430	32	9-55	1050	32	9-55	1055	33	10-53	1530	32	22-52	0930	40	3-53	1745	38
9-61	1430	33	3-61	1140	32	19-59	1300	33	23-53	1030	40	7-53	1430	48	29-53	1610	54
29-62	1430	32	11-63	1600	32	15-60	1000	32	26-54	1630	36	8-54	0900	41	30-53	1515	56
16-63	1530	32	26-64	1500	32	22-60	1500	34	6-55	1035	32	22-54	1015	42	21-55	1540	56
2-64	0900	33	12-65	1600	32	2-61	1230	33	23-56	1155	36	4-55	1015	36	25-56	1230	57
31-64	1600	32				4-62	1430	32	23-59	1600	47	27-55	1050	36	25-56	1430	57
13-65	1500	33							11-60	1500	41	18-56	1100	47	17-57	1100	45
									19-62	1400	48	6-57	1200	41	3-58	1130	48
									3-63	1400	33	31-57	1600	52	13-61	1450	54
									21-65	0830	38	7-58	1100	39	20-62	0900	48
												26-59	1130	42	1-64	0615	37
												11-60	1545	44	8-64	1100	42
												1-61	1410	50	4-65	1500	44
												22-61	1550	47	17-65	1410	48
												8-62	1500	43			
												22-62	1030	42			
												25-62	1000	40			
												8-63	1030	39			
												27-63	1500	51			
												11-64	1630	40			
												13-64	1200	43			
												18-64	1430	44			
												20-64	1230	44			
												25-64	1355	43			
												13-65	0900	38			
July			August			September			October			November			December		
8-49	1400	62	17-49	1600	57	26-51	1600	40	26-51	1630	33	17-50	1600	32	21-50	1600	32
28-50	1100	59	7-50	1230	56	10-54	1645	60	22-52	0930	36	27-51	1600	32	12-52	1030	33
29-52	1115	64	23-51	1145	54	2-55	1420	66	19-54	1100	38	26-52	1530	32	21-55	1020	32
24-53	1640	50	4-52	1115	60	3-57	1400	58	12-55	1010	41	3-53	1330	32	7-59	1100	32
7-55	0930	44	27-52	1555	65	12-58	1300	58	1-56	0930	42	23-54	1415	40	5-60	1255	32
5-57	1215	60	5-55	1100	52	15-61	1415	58	31-56	1430	34	22-55	1100	33	20-61	1450	34
10-58	1500	62	1-56	0900	54	17-63	1500	54	9-57	1130	43	5-57	1200	33	2-62	1200	32
27-59	1100	63	27-56	0900	51				13-58	1400	52	3-59	1430	37	7-64	1330	33
19-60	0800	56	12-58	1530	68				3-60	1230	58	24-61	1400	32	3-65	0930	32
10-63	1400	60	26-60	1430	55				16-61	1420	52	2-62	1430	40			
10-64	1100	59	1-61	1410	74				8-62	1500	45	26-63	0900	33			
27-65	1345	64	5-63	1200	65				22-63	1115	49	10-64	1530	38			
			8-63	1220	68				5-64	1530	49	1-65	1430	44			
			24-64	1400	60				5-65	1500	46						

68. Tenmile Creek near Helena, Mont. (6-0630)

Location.--At gaging station, lat 46°36'20", long 112°05'20", near center of SE¼ sec.22, T.10 N., R.4 W., on right bank at Broadwater Hotel, 1½ miles west of Helena and 2½ miles upstream from Sevenmile Creek. Altitude of gage is 3,960 ft (from topographic map).

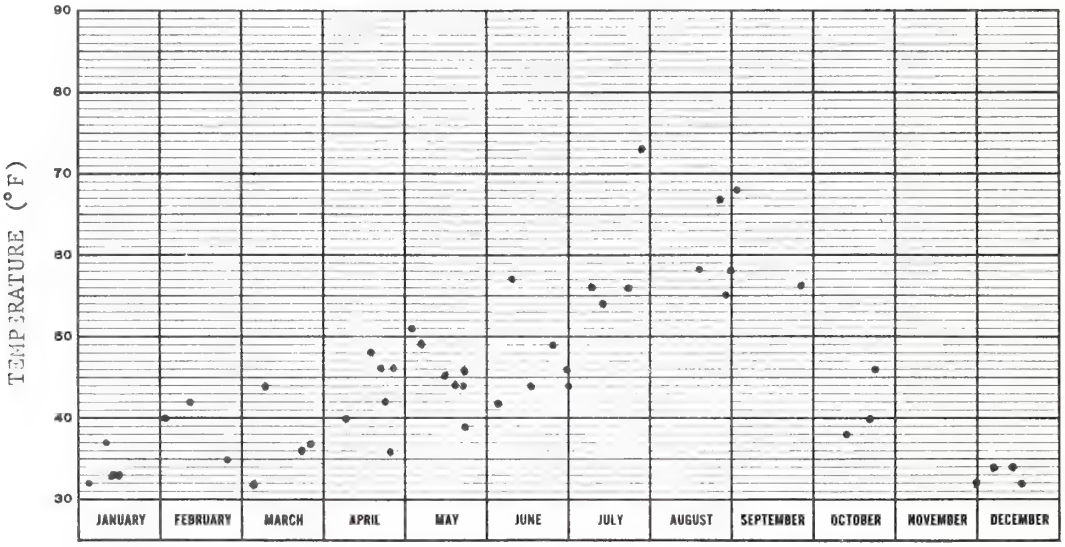
Drainage area.--102 sq mi.

Water temperature records available.--48 spot observations made at time of discharge measurements during period May 1949 to September 1954.

Extremes.--Discharge 1908-54: Maximum, 995 cfs May 28, 1917; no flow at times.

Water temperatures 1949-54: Maximum observed, 73°F July 29, 1952; minimum, freezing point on many days during winter months.

Remarks.--Flow may be completely depleted during summer months. Water temperatures may show effect of thermal springs in the vicinity.



Spot observations of water temperatures, 1949-54

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-52	1100	32	13-52	1500	42	6-52	0900	32	17-51	1400	48	20-49	1200	44	9-49	1130	57
13-53	1700	33	1-54	1230	40	27-52	1730	37	21-52	1630	46	15-50	1600	45	30-49	0930	46
15-53	1600	33	25-54	1400	35	28-52	0800	37	28-52	1230	46	23-50	1100	39	16-50	1130	44
12-54	1630	37				9-53	1500	44	10-53	1200	40	3-51	1630	47	25-52	1200	49
						23-54	0900	36	23-53	1200	42	22-52	1100	46	3-53	1515	42
									26-54	1430	36	7-53	1600	49	30-53	0700	44
												22-54	0815	44			
July			August			September			October			November			December		
8-49	1100	56	17-49	1700	58	1-50	1420	68	21-49	1630	40	30-52	1250	32	14-50	1200	32
11-50	1025	54	30-51	1530	55	25-52	1130	56	10-51	2100	38				12-52	1500	34
29-52	1330	73	31-51	1500	58				22-52	1130	46				7-53	1400	34
24-53	1430	56	27-52	1130	67												

69. Missouri River below Holter Dam, near Wolf Creek, Mont. (6-0665)

Location.--At gaging station, lat 46°59'40", long 112°00'50", in S½ sec.5, T.14 N., R.3 W., on left bank a quarter of a mile downstream from Holter Dam, 3 miles southeast of Wolf Creek, and at mile 2,203.8. Datum of gage is 3,464.11 ft above mean sea level, datum of 1929.

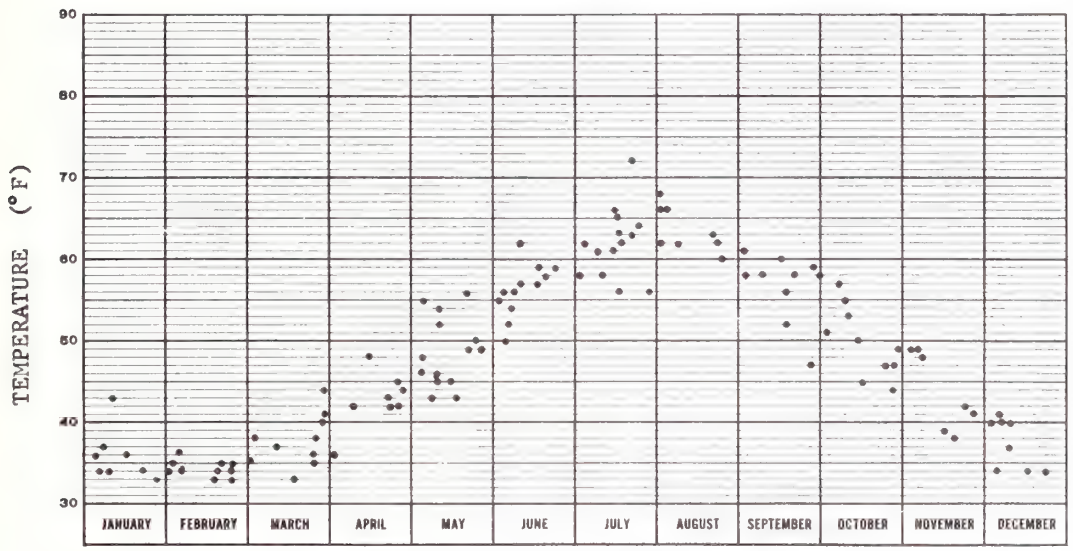
Drainage area.--17,149 sq mi.

Water temperature records available.--127 spot observations made at time of discharge measurements during period May 1949 to December 1965.

Extremes.--Discharge, 1945-65: Maximum, 34,800 cfs June 8, 1948; minimum daily, 747 cfs May 27, 1962.

Water temperatures 1949-65: Maximum observed, 72°F July 20, 1959; minimum observed, 33°F Jan. 28, 1952, Feb. 18, 1952, Mar. 17, 1952, Feb. 27, 1961.

Remarks.--Water temperatures affected by storage in Holter Lake.



Spot observations of water temperatures, 1949-65

69. Missouri River below Holter Dam, near Wolf Creek, Mont. (6-0665)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
22-51	1500	34	26-51	1600	34	26-51	1530	36	14-52	1400	48	11-49	1200	54	21-51	1500	58
28-52	1100	33	18-52	1500	33	17-52	1430	33	11-56	1230	42	4-51	1410	46	9-52	1050	62
12-59	1100	43	24-53	1500	35	30-53	1200	44	23-58	1400	42	20-51	1530	56	4-56	1450	56
8-60	1100	37	21-57	1250	34	27-57	1230	38	29-59	1200	44	5-52	1140	55	8-56	1330	56
6-61	1435	34	7-58	1300	36	12-58	1230	37	26-61	1125	42	11-56	1300	52	11-57	1620	57
6-63	1005	36	2-61	1030	34	29-61	1625	40	26-62	0910	45	3-57	1500	48	6-58	1400	56
10-64	1200	34	27-61	1115	33	25-62	1030	35	22-63	1040	43	23-57	1520	50	17-59	1400	59
13-65	1630	36	27-62	1400	34	3-63	1055	38	1-65	1330	36	10-60	1720	46	1-61	1440	55
			7-63	1230	34	30-63	1400	41				17-60	1700	43	22-61	1610	59
			3-64	1630	35	26-64	1015	36				14-63	0505	45	7-62	1030	52
			25-64	1125	35	1-65	1430	35				20-63	1130	49	6-63	1415	54
												12-64	0900	45	16-64	1500	57
												25-64	1700	49	4-65	1300	50
												10-65	1400	43	23-65	1600	59
July			August			September			October			November			December		
9-51	1700	61	1-49	1300	68	17-51	1500	60	6-49	1630	57	16-51	0800	39	17-51	1500	34
14-52	1130	66	1-50	1230	66	22-52	1200	58	30-50	1500	49	4-52	1120	49	8-52	1230	34
5-56	1430	62	3-53	1040	66	28-53	1200	47	15-51	1300	50	28-56	1300	41	9-59	1200	37
10-56	1815	58	21-56	1215	63	19-58	1200	52	25-56	1230	47	25-57	1230	42	2-60	1330	40
10-56	1140	58	27-60	1130	60	18-59	1400	56	27-59	1400	44	20-61	1030	38	12-62	1630	40
26-56	1630	64	1-62	1430	66	30-60	1350	58	17-61	1000	45	7-62	1500	49	4-63	1630	40
16-57	0800	65	10-62	1600	62	12-61	1200	58	8-62	1100	55	25-64	1600	42	21-64	1430	34
15-58	1330	56	1-64	1530	62	12-62	1400	58	29-63	1700	47	9-65	1130	48	6-65	1130	41
20-59	1600	72	25-65	1100	62	4-63	1400	61	12-64	1100	53						
13-60	1045	61				29-63	1235	59	1-65	1130	51						
24-61	1305	63				2-64	1200	58									
1-63	1340	58															
16-63	1635	63															
29-63	0725	56															
16-65	1330	62															

70. Little Prickly Pear Creek at Sieben Ranch, near Wolf Creek, Mont. (6-0711)

Location.--At gaging station, lat 46°53'50", long 112°07'40", near east line of SE¼ sec.8, T.13 N., R.4 W., on left bank 30 ft downstream from farm bridge, a quarter of a mile upstream from Clark Creek and 8 miles south of Wolf Creek. Altitude of gage is 3,880 ft (from topographic map).

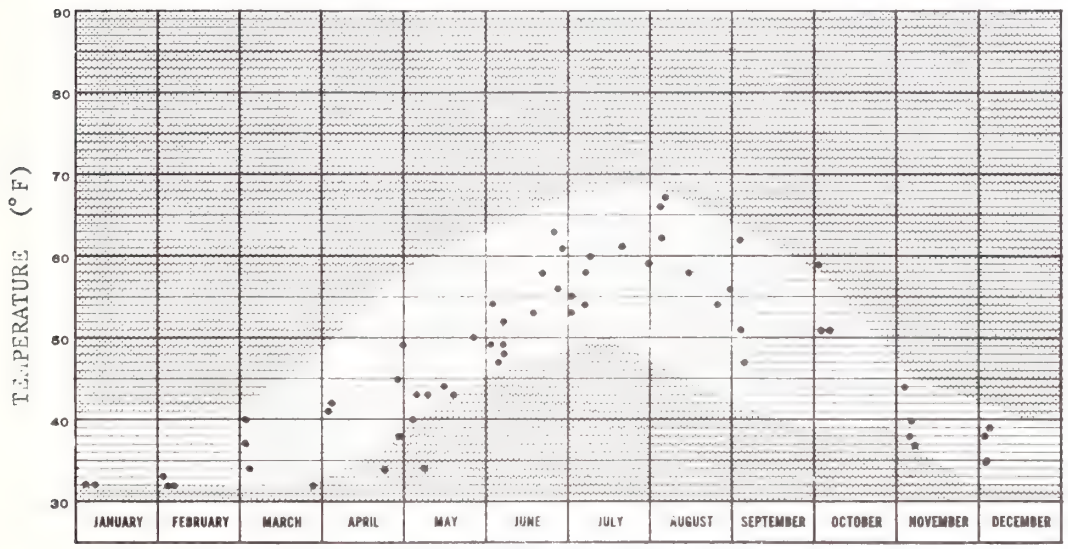
Drainage area.--270 sq mi.

Water temperature records available.--62 spot observations made at time of discharge measurements during period April 1962 to December 1965. Thermograph records during period June to September 1965 published in this report. Once-daily observations May 1962 to December 1965 (some fragmentary) published in reports of the Geological Survey.

Extremes.--Discharge 1962-65: Maximum, 972 cfs June 9, 1964; minimum, 4.6 cfs Dec. 16, 1964.

Water temperatures 1962-65: Maximum observed, 68°F July 7, 22, 29, 1963, July 26, 29, Aug. 1, 2, 9, 1965; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1962-65.
The unshaded area delineates the range between the highest and lowest temperature from once-daily observations, 1962-65 and thermograph record, 1965.

70. Little Prickly Pear Creek at Sieben Ranch, near Wolf Creek, Mont. (6-0711)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-63	0940	32	5-63	1130	32	5-63	0830	34	29-62	1630	45	15-62	1645	44	6-62	1130	47
7-64	0900	32	4-64	0930	32	3-64	1340	37	2-63	1355	41	26-62	1430	50	20-62	0800	58
5-65	0930	32	2-65	1100	33	31-64	0850	35	30-63	1200	49	5-64	0930	40	2-64	1130	49
			3-65	1035	32	3-65	1515	40	7-65	1130	42	6-64	0720	43	8-64	1200	49
						29-65	0855	32	23-65	1150	34	12-64	0640	43	9-64	1235	48
									29-65	1800	38	19-64	1135	53	16-64	1200	53
												10-65	1145	33	25-64	1400	63
															28-64	1240	56
															29-64	1805	61
															3-65	1930	54
															9-65	1205	52
July			August			September			October			November			December		
1-62	0830	53	15-62	0830	53	5-62	0825	47	2-62	1300	51	7-62	1020	37	5-62	1425	39
19-62	1600	61	6-63	1400	67	4-63	1330	62	1-63	1425	59	6-63	1030	40	5-63	0850	35
31-62	1110	59	4-64	1430	66	4-64	1215	51	6-64	1400	51	5-64	0915	38	2-65	1400	38
9-64	1010	58	24-64	1130	54							3-65	0945	44			
10-64	1140	60	5-65	1420	62												
2-65	1300	55	31-65	1320	56												
8-65	0955	54															

LITTLE PRICKLY PEAR CREEK BASIN

70. Little Prickly Pear Creek at Sieben Ranch, near Wolf Creek Mont. (6-0711)

Water temperatures (°F), June to September 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
June																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	57	-	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	53	48	-	--
July																																
Maximum.....	60	58	62	60	63	65	60	64	66	64	60	59	62	64	66	--	--	--	65	64	64	64	65	66	64	68	66	67	68	67	66	64
Minimum.....	50	50	52	54	52	52	53	52	54	55	54	54	50	50	52	54	--	--	--	54	53	52	51	52	52	54	--	53	55	55	54	52
August																																
Maximum.....	68	68	63	63	64	66	66	66	68	67	67	66	64	63	63	62	63	64	63	58	60	60	56	58	60	60	62	58	--	50	52	62
Minimum.....	54	54	56	56	54	54	52	53	54	55	55	58	55	50	50	50	50	52	52	56	56	55	54	54	53	52	50	52	48	--	42	53
September																																
Maximum.....	52	53	50	47	45	44	50	48	44	42	44	44	42	43	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	42	44	44	42	40	41	42	42	41	40	40	39	38	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max	--	--	--	--	56	67	66	67	58	52	46	40
	Min	--	--	--	--	41	46	50	50	41	40	33	32
1963	Max	41	41	47	54	63	63	68	65	63	58	44	38
	Min	32	32	34	37	44	50	55	57	49	42	33	--
1964	Max	--	38	43	58	54	61	66	64	56	52	46	36
	Min	32	32	33	38	40	48	52	51	49	43	32	32
1965	Max	--	--	--	48	53	59	66	66	58	52	--	--
	Min	32	32	32	41	40	46	53	48	39	39	--	--

Summary of thermograph record

1965	Max	--	--	--	--	--	--	--	--	68	68	53	--	--	--	--	--	--	--
	Min	--	--	--	--	--	--	--	--	50	42	--	--	--	--	--	--	--	--

Extremes for years 1962-65

	Max	41	41	47	58	63	67	68	68	63	58	46	40
	Min	32	32	32	37	40	46	50	42	39	39	32	32

71. Lyons Creek near Wolf Creek, Mont. (6-0712)

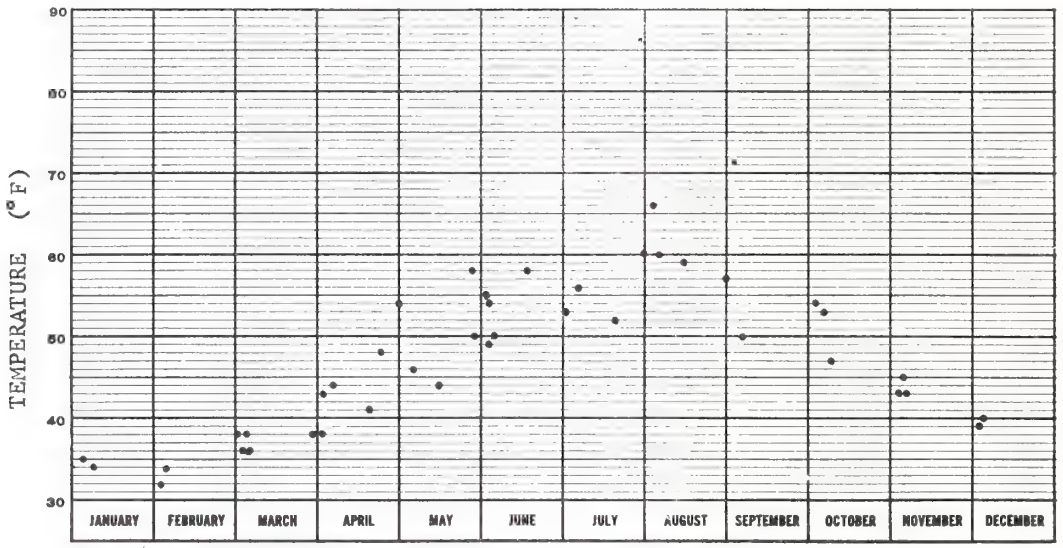
Location.--At crest-stage gage, lat 46°56', long 112°08', in NE¼ sec.29, T.14 N., R.4 W., 135 ft upstream from mouth, 5½ miles southwest of Wolf Creek. Altitude of gage is 3,730 ft (from topographic map).

Drainage area.--29.4 sq mi.

Water temperature records available.--41 spot observations made at time of discharge measurement or inspection during period May 1960 to December 1965.

Extremes.--Discharge 1959-65: Maximum, 490 cfs June 8, 1964; minimum not determined.

Water temperatures 1960-65: Maximum observed, 66°F Aug. 4, 1964; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1960-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-63	1200	35	5-63	1330	34	5-63	1100	36	25-61	1000	48	5-60	1915	46	5-62	1705	50
7-64	1045	34	3-65	1155	32	3-64	1425	36	20-62	1115	41	28-61	1545	58	19-62	1410	58
						31-64	1035	38	2-63	1550	43	16-62	1110	44	5-63	1145	49
						3-65	1350	38	30-63	1535	54	28-62	1230	50	2-64	1740	55
									1-65	1930	38	6-64	1130	46	3-65	1715	54
									7-65	1415	44						
July			August			September			October			November			December		
1-62	1040	53	15-62	1140	59	5-62	1040	50	2-62	1455	54	7-62	1400	43	5-62	1600	40
20-62	0900	52	4-64	1540	66				6-64	1320	53	6-63	1400	45	2-65	1230	39
31-62	1430	60	5-65	1215	60				8-65	1010	47	3-65	1200	43			
8-65	1135	56	31-65	1540	57												

72. Little Prickly Pear Creek at Wolf Creek, Mont. (6-0713)

Location.--At gaging station, lat 47°00'20", long 112°04'00", in SW¼SE¼ sec.35, T.15 N., R.4 W., on left bank 25 ft downstream from county bridge, 150 ft south of Wolf Creek post office, and half a mile downstream from Wolf Creek. Datum of gage is 3,550.61 ft above mean sea level, datum of 1929, supplementary adjustment of 1962.

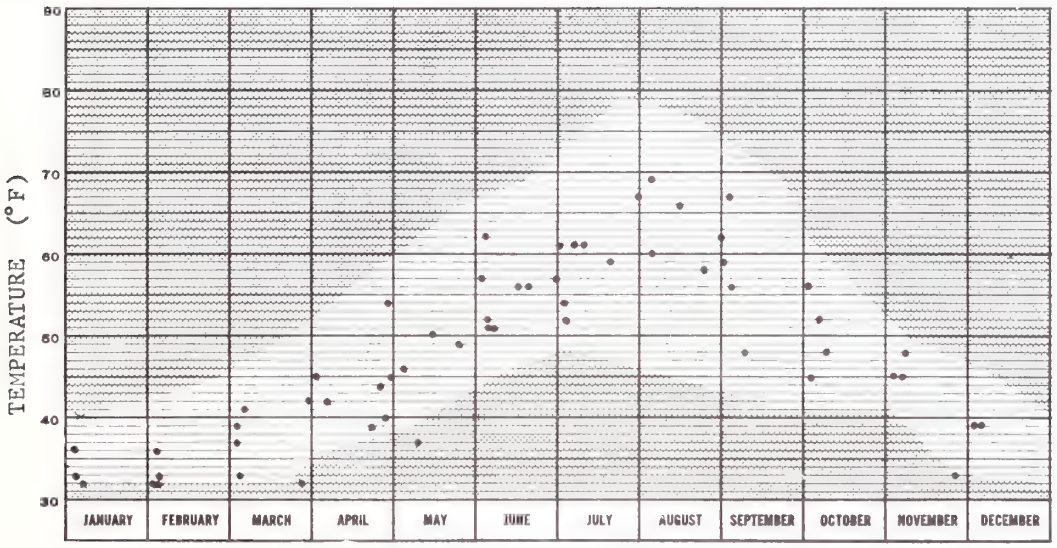
Drainage area.--381 sq mi.

Water temperature records available.--60 spot observations made at time of discharge measurements during period April 1962 to December 1965. Thermograph record during period June to September 1965 published in this report. Once-daily observations May 1962 to December 1965 (some fragmentary) published in reports of the Geological Survey.

Extremes.--Discharge 1962-65: Maximum, 3,110 cfs June 9, 1964; minimum daily, 14 cfs Dec. 13, 1963.

Water temperatures 1962-65: Maximum observed, 79°F July 22, 1963; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1962-65.
The unshaded area delineates the range between the highest and lowest temperature from once-daily observations, 1962-65, and thermograph record, 1965.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-63	1410	36	5-63	1600	33	5-63	1240	33	29-62	1330	45	16-62	1600	50	5-62	1500	51
7-64	1330	32	4-64	1200	36	3-64	1600	39	2-63	1655	45	26-62	1300	49	19-62	1130	56
5-65	0830	33	2-65	1300	32	31-64	1235	42	30-63	1725	54	5-64	1245	46	5-63	1300	52
			3-65	1445	32	3-65	1300	37	7-65	1000	42	10-65	1240	37	2-64	1540	57
						9-65	1600	41	23-65	1405	39				9-64	1730	51
						29-65	0940	32	28-65	1530	44				16-64	1800	56
									29-65	1700	40				30-64	0920	57
															3-65	1450	62
July			August			September			October			November			December		
1-62	1200	61	15-62	1410	66	5-62	1215	56	2-62	1615	56	7-62	1630	48	5-62	1700	39
20-62	1035	59	4-64	1700	69	4-63	1630	67	6-64	1250	52	6-63	1730	45	5-63	1050	39
31-62	1530	67	24-64	1300	58	1-65	1000	59	3-65	0840	45	27-64	1530	33	2-65	1100	39
2-63	0815	54	5-65	1030	60	9-65	1145	48	8-65	0800	48	3-65	1620	45			
10-64	1245	61	31-65	1750	62							5-65	0915	45			
2-65	1045	52															
8-65	1400	61															

LITTLE PRICKLY PEAR CREEK BASIN

72. Little Prickly Pear Creek at Wolf Creek, Mont. (6-0713)

Water temperatures (°F), June to September 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
June																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	58	-	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	46	-	--
July																																
Maximum.....	60	59	62	60	60	64	60	64	66	65	60	60	62	64	66	68	--	--	66	65	64	65	65	66	65	68	67	67	66	68	68	64
Minimum.....	48	50	52	53	52	52	53	52	54	56	55	54	50	52	54	54	55	--	56	56	54	55	52	53	54	56	56	56	57	56	56	54
August																																
Maximum.....	68	68	64	62	64	66	68	68	68	68	69	68	65	66	66	66	66	67	64	60	60	61	58	58	60	62	63	59	56	53	54	64
Minimum.....	56	56	58	55	55	56	54	56	56	57	58	59	56	53	54	54	54	55	55	58	56	56	55	54	54	54	52	54	49	48	43	54
September																																
Maximum.....	56	56	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	45	46	46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max	--	--	--	--	58	68	71	77	66	58	49	43
	Min	--	--	--	--	46	50	56	60	46	43	37	33
1963	Max	40	45	51	59	66	69	79	74	68	61	48	43
	Min	32	33	36	35	45	49	60	56	51	44	34	33
1964	Max	39	42	44	56	60	60	70	69	67	56	49	41
	Min	33	33	32	40	44	48	54	50	46	41	33	32
1965	Max	40	43	45	52	58	58	69	67	59	57	49	46
	Min	32	33	33	40	38	45	48	52	41	46	36	33

Summary of thermograph record

1965	Max	--	--	--	--	--	--	68	69	--	--	--	--
	Min	--	--	--	--	--	--	48	43	--	--	--	--

Extremes for years 1962-65

	Max	40	45	51	59	66	69	79	77	68	61	49	46
	Min	32	33	32	35	38	45	48	43	41	41	33	32

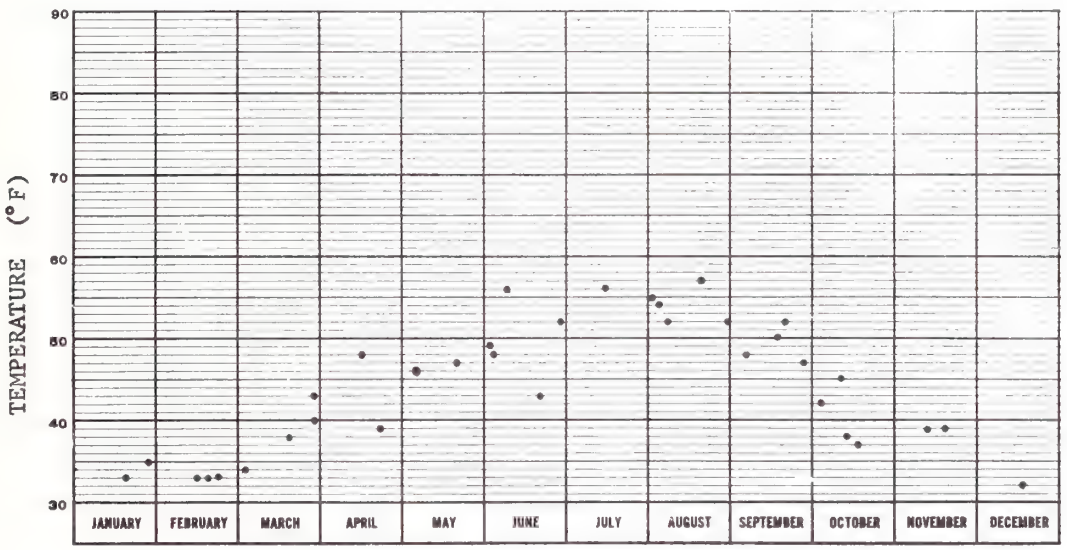
73. Dearborn River near Clemons, Mont. (6-0730)

Location.--At gaging station, lat 47°17'30", long 112°27'00", in SE¼SE¼ sec.23, T.18 N., R.7 W., on right bank 300 ft upstream from highway bridge, half a mile southeast of former post office at Clemons, 2 miles downstream from Falls Creek, 14 miles south of Augusta, and at mile 36. Altitude of gage is 4,560 ft (by barometer).

Drainage area.--123 sq mi.

Water temperature records available.--35 spot observations made at time of discharge measurements during period June 1949 to October 1953.

Extremes.--Discharge 1921-23, 1929-53, 1964: Maximum, 17,400 cfs June 9, 1964; minimum, 7.4 cfs Oct. 22, 23, 1936.
Water temperatures 1949-53: Maximum observed, 57°F Aug. 19, 1952; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
19-51	1530	33	15-51	1430	33	1-51	1300	34	24-51	1040	39	21-51	1315	47	3-49	1400	48
29-52	1100	35	19-52	1130	33	30-51	0930	40	14-52	1700	48	5-52	1700	46	20-51	1450	43
			24-53	1830	33	18-52	1000	38							9-52	1800	56
						30-53	1530	43							1-53	1430	49
															29-53	1530	52
July			August			September			October			November			December		
14-52	1500	56	1-49	1930	55	28-49	1830	47	12-50	0850	45	13-51	1130	39	18-51	1200	32
			8-50	1100	52	8-50	1345	48	16-51	1030	37	18-52	1300	39			
			19-52	1330	57	18-51	1100	50	13-52	1100	38						
			3-53	1730	54	22-52	1500	52	2-53	1700	42						
			31-53	1500	52												

74. Dearborn River near Craig, Mont. (6-0735)

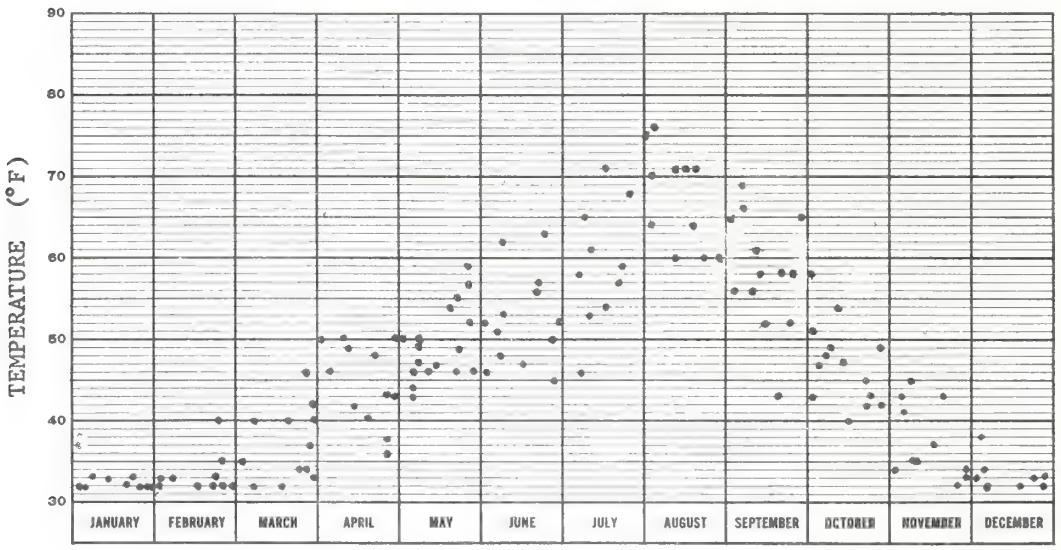
Location.--At gaging station, lat 47°11'55", long 112°05'25", in NE¼SE¼ sec.27, T.17 N., R.4 W., on right bank just downstream from abandoned bridge a quarter of a mile downstream from bridge on State Highway 287, 5 miles downstream from South Fork, 10 miles northwest of Craig, and 12 miles upstream from mouth. Altitude of gage is 3,790 ft (from topographic map).

Drainage area.--325 sq mi.

Water temperature records available.--158 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1945-65: Maximum, 15,400 cfs June 9, 1964; minimum, 8.0 cfs Aug. 17, 1961.

Water temperatures 1949-65: Maximum observed, 76°F Aug. 3, 1963; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

74. Dearborn River near Craig, Mont. (6-0735)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-51	1600	32	5-51	1300	32	26-51	1240	36	20-49	1400	49	4-51	1040	44	3-49	1200	52
21-52	1330	32	26-51	1220	32	17-52	1000	32	14-52	1530	50	20-51	1145	46	28-49	1230	50
4-54	1200	33	18-52	1100	32	30-53	1400	42	26-56	1045	40	5-52	1400	46	28-51	1120	45
31-55	1200	32	24-53	1700	32	10-55	1700	32	29-58	1530	44	1-55	1300	50	9-52	1530	62
3-61	1200	32	1-54	1200	32	27-56	1125	34	29-59	1500	50	29-55	1030	46	29-53	1145	52
29-61	1200	32	27-56	1410	32	27-57	1400	37	1-60	1400	50	20-56	1830	55	26-56	1400	57
29-62	1245	32	1-60	1000	32	24-59	1200	40	28-60	1330	38	8-57	1630	47	7-57	1200	57
28-63	1145	32	29-60	1000	32	27-61	1100	34	25-61	1200	36	23-57	1730	49	6-58	1130	51
26-64	1430	33	26-61	1130	35	30-62	1100	40	30-62	1310	46	8-58	1330	50	8-59	1630	53
14-65	1040	33	7-63	1530	33	27-63	1040	46	28-63	1010	43	11-59	1300	46	8-60	1200	48
			11-63	1815	32	26-64	1500	34	8-64	1300	46	24-61	2000	57	26-62	1030	56
			26-63	1340	40	3-65	1305	35	23-65	1600	42	26-62	0900	48	6-63	0830	46
			25-64	1520	33	9-65	1720	40				28-62	1430	52	12-63	0700	47
			2-65	1500	33	29-65	1130	33				14-63	0930	47	3-64	1915	46
												28-63	1700	59	27-64	1550	63
												5-64	1100	43	22-65	1830	57
												19-64	1705	54			
												25-64	1835	52			
July			August			September			October			November			December		
9-51	1205	46	1-49	1700	75	8-50	1600	56	12-50	1310	54	12-51	1100	35	17-51	1130	32
14-52	1330	66	13-51	1230	60	17-51	1100	52	15-51	1040	40	18-52	1200	37	29-54	1100	32
13-53	1140	61	19-52	1030	64	22-52	1330	52	13-52	0930	47	9-53	1130	41	2-59	1200	38
23-54	1630	59	3-53	1400	70	19-54	1415	58	2-53	1845	51	25-57	1400	43	4-62	0900	32
11-55	1035	53	31-53	1200	67	10-56	1730	61	21-54	1600	45	28-60	1500	32	27-62	1100	32
24-56	1200	68	29-55	1045	60	4-57	1400	66	8-55	1325	48	3-61	1100	34	1-63	1430	33
15-58	1100	54	19-58	1600	71	17-58	1130	52	23-56	0830	44	30-61	1530	34	26-63	1030	33
14-59	0900	58	3-60	1000	64	22-59	1300	43	29-57	1230	49	6-62	1230	43	29-64	1105	33
13-60	1900	68	14-61	1730	71	12-61	1500	58	13-58	1130	42	30-64	1455	33	4-65	1200	34
14-61	1605	71	3-63	1500	76	3-62	1600	56	28-59	1230	43	11-65	1130	45			
18-62	0930	57	15-63	1230	71	4-63	1700	69	25-60	1200	45						
10-64	1400	65	24-64	1430	60	29-63	1620	65	9-61	1300	49						
9-65	1200	58				1-65	1330	65	2-62	1400	58						
									29-63	1900	42						
									6-64	1030	47						
									27-64	1215	42						
									3-65	0730	43						

75. Newland Creek near White Sulphur Springs, Mont. (6-0760)

Location.--At gaging station, lat 46°44', long 110°50', near line between secs. 9 and 10, T.11 N., R.7 E., 13 miles north of White Sulphur Springs, and 15 miles upstream from mouth. Altitude of gage is 5,590 ft (by barometer).

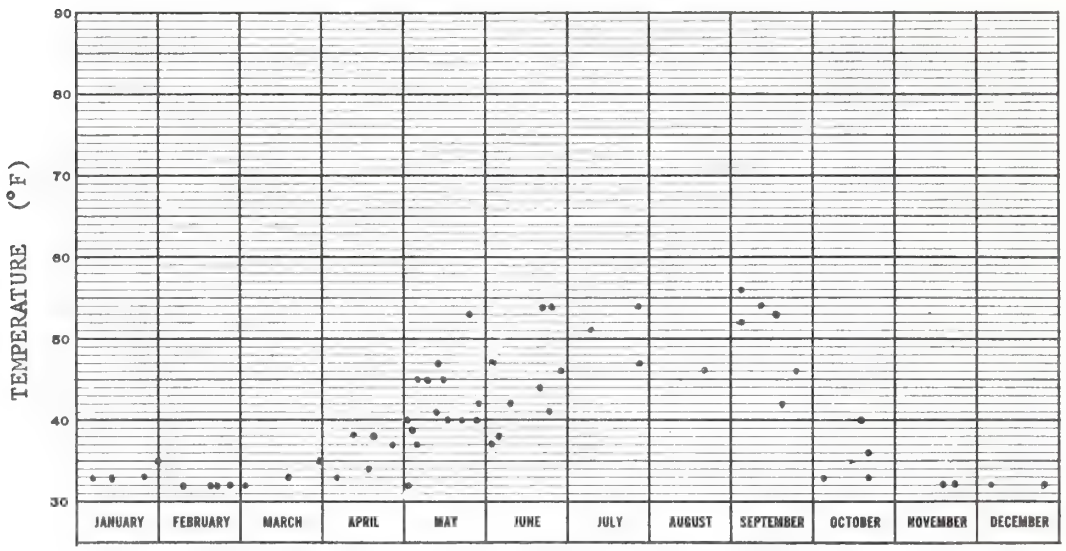
Drainage area.--6.74 sq mi.

Water temperature records available.--58 spot observations made at time of discharge measurements during periods February 1949 to November 1953 and September 1959 to December 1965.

Extremes.--Discharge 1945-53, 1959-65: Maximum, 56 cfs June 4, 1953.

Discharge 1945-53: Minimum, 0.1 cfs Jan. 26, 1951.

Water temperatures 1949-53, 1959-65: Maximum observed, 56°F Sept. 3, 1950; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1959-65

75. Newland Creek near White Sulphur Springs, Mont. (6-0760)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-51	1500	33	28-49	1100	32	1-51	0930	32	4-49	1830	33	3-49	0930	37	16-49	1030	44
7-52	1200	33	7-51	1200	32	26-52	1600	33	26-50	1730	34	16-49	1730	45	2-50	1000	37
28-52	1700	33	25-52	1600	32	31-53	1100	35	23-52	1100	38	15-50	1640	41	24-50	1415	54
31-53	1145	35	24-53	1500	32				30-53	1115	37	1-51	0955	32	5-51	1150	42
									20-62	1300	38	18-51	0850	40	19-51	0900	41
												29-51	1350	42	25-52	1505	46
												3-52	1630	45	3-53	0855	38
												23-52	1230	45	1-60	1200	47
												24-52	0845	40	21-61	1715	54
												1-53	0930	40			
												28-53	0900	40			
												4-60	1745	39			
												12-60	1525	45			
												26-61	1610	53			
												13-64	1550	47			
July			August			September			October			November			December		
28-49	1300	47	26-51	1420	46	3-50	1700	56	3-50	1420	33	26-51	1500	32	4-50	1500	32
28-52	1415	54				24-51	1710	42	23-50	1500	40	28-52	1330	32	29-52	1330	32
10-53	1200	51				3-52	1800	52	27-51	1600	33						
						29-52	1545	46	27-52	1530	36						
						9-53	1200	54									
						17-59	1130	53									

76. Newland Creek near damsite, near White Sulphur Springs, Mont. (6-0765)

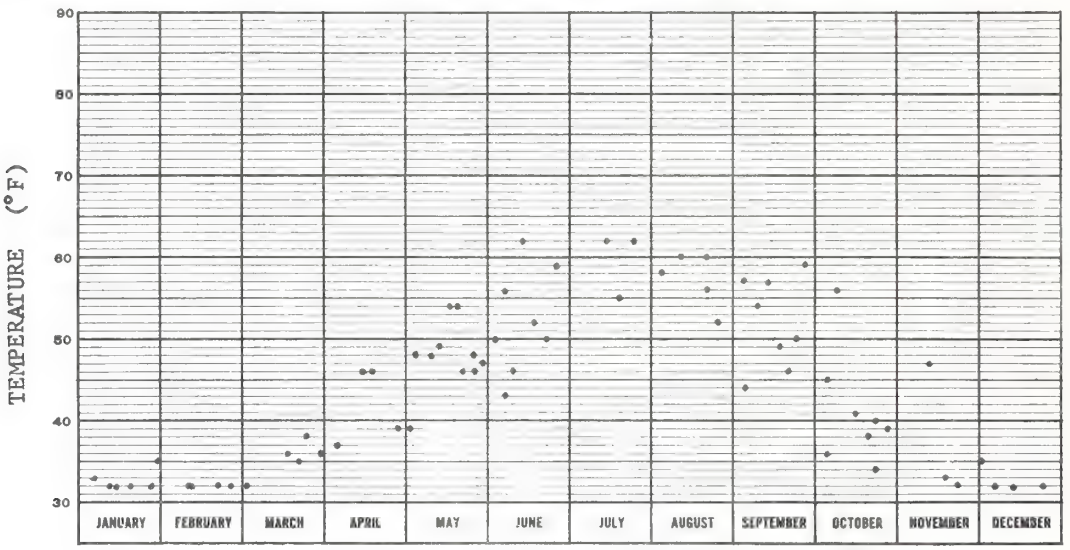
Location.--At gaging station, lat 46°38', long 110°57', in NW¼ sec.14, T.10 N., R.6 E., on right bank 50 ft upstream from farm bridge, 4 miles downstream from U. S. Highway 89, and 6 miles north of White Sulphur Springs. Altitude of gage is 5,100 ft (by barometer).

Drainage area.--44.8 sq mi.

Water temperature records available.--68 spot observations made at time of discharge measurements during period September 1950 to September 1957.

Extremes.--Discharge 1950-57: Maximum, 227 cfs June 5, 1953; minimum daily, 0.6 cfs Mar. 7, 1953.

Water temperatures 1950-57: Maximum observed, 62°F July 28, 1952, July 14, 1954, June 13, 1955; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1950-57

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-51	1000	33	25-52	1430	32	1-51	1100	32	30-51	1745	39	17-51	1600	54	5-51	0905	43
8-52	0950	32	10-54	1500	33	28-51	1520	35	22-52	1635	46	3-52	1430	48	18-51	1710	52
29-52	0925	32	10-55	0800	32	25-52	1435	36	23-52	1430	46	23-52	0925	46	25-52	1735	50
31-53	1200	35	28-55	1430	32	31-53	1230	36	4-56	1230	37	1-53	0800	39	2-53	1840	50
13-54	1730	32				29-57	1430	38				28-53	2000	47	8-54	1400	46
7-55	1300	32										19-54	1200	46	13-55	1530	62
												23-55	1330	48	27-56	0800	59
												8-56	1100	49	5-57	1130	56
												18-56	1200	54			
												7-57	1300	48			
July			August			September			October			November			December		
28-52	1700	62	3-51	0800	58	3-50	1900	57	3-50	1005	36	26-51	1330	33	4-50	1320	32
14-54	1500	62	26-51	1615	52	24-51	1410	46	23-50	1800	41	28-52	1230	32	29-52	1500	32
20-55	1010	55	22-55	1310	56	3-52	1400	44	27-51	1300	34	12-53	1100	47	1-53	1130	35
			22-56	1845	60	29-52	1245	59	27-52	1315	40				7-54	1230	32
			12-57	1200	60	9-53	1230	54	6-53	1400	56						
						13-54	1435	57	29-54	1300	39						
						21-56	1000	49	3-55	1100	45						
						26-57	1000	50	26-56	1400	38						

77. Sheep Creek near White Sulphur Springs, Mont. (6-0770)

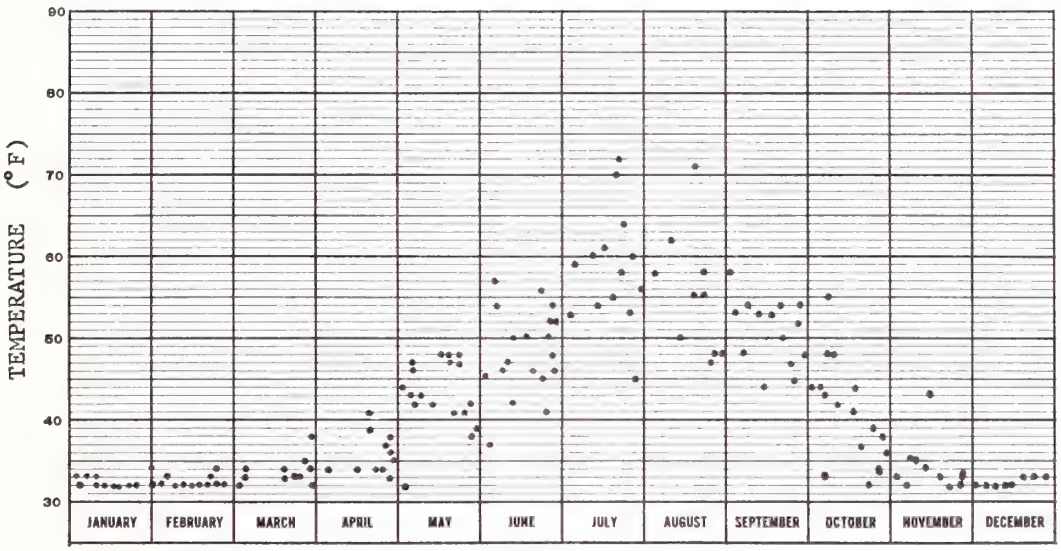
Location.--At gaging station, lat 46°46', long 110°49', in SW¼SE¼ sec.26, T.12 N., R.7 E., on right bank 7 miles upstream from Moose Creek and 16 miles north of White Sulphur Springs. Altitude of gage is 5,820 ft (by barometer).

Drainage area.--54.4 sq mi.

Water temperature records available.--155 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1941-65: Maximum, 460 cfs June 4, 1953; minimum daily, 3.5 cfs Jan. 18-20, 1943.

Water temperatures 1949-65: Maximum observed, 72°F July 25, 1956; minimum, freezing point on many days during month.



Spot observations of water temperatures, 1949-65

77. Sheep Creek near White Sulphur Springs, Mont. (6-0770)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-51	1620	33	7-51	1015	32	28-51	1200	33	4-49	1930	34	3-49	1530	43	16-49	1300	46
7-52	0930	33	28-51	1610	32	26-52	1420	34	26-50	1400	34	15-50	1750	42	2-50	0835	37
28-52	1355	32	26-52	1230	34	31-53	1000	38	23-52	1305	39	1-51	1255	32	24-50	1610	54
31-53	1000	34	24-53	1400	33	31-60	1700	32	30-53	1200	35	18-51	1035	48	19-51	1010	41
12-54	1700	32	10-54	1730	32	1-61	1255	32	25-55	1300	34	29-51	1200	39	25-52	1600	46
7-55	1200	32	9-55	1500	32	28-61	1615	33	21-58	1230	34	4-52	1245	42	8-54	1530	47
4-61	1140	32	23-56	1800	32	26-62	1300	33	28-61	1250	36	23-52	1630	48	13-55	1805	50
31-61	1215	32	26-62	1200	32	2-63	1150	34	27-62	1300	37	1-53	1030	44	27-56	1830	52
24-62	1130	32	8-63	2000	32	29-63	0940	35	23-63	1655	41	28-53	1000	38	5-57	1300	57
5-63	0900	33	2-64	1200	32	2-64	1500	33	27-64	1630	33	19-54	1300	47	5-58	1400	54
8-64	1200	32	3-65	1200	33	30-65	1300	34	28-65	1500	38	23-55	1530	41	9-59	1700	50
12-65	1230	32	28-65	1130	32							8-56	1230	47	19-59	1100	56
												7-57	1400	46	21-61	1610	50
												14-58	1230	49	23-62	1535	52
												12-60	1800	43	7-63	1840	46
												27-61	1015	42	1-64	1400	45
												25-62	1030	41	9-64	1230	42
												21-63	1545	47	17-64	1520	45
															22-65	1330	48
July			August			September			October			November			December		
28-50	1410	53	3-51	1430	58	3-50	1830	53	3-50	1145	33	26-51	1630	32	4-50	1630	32
28-52	1545	60	26-51	1340	48	24-51	1540	45	24-50	0815	32	28-52	1500	33	29-52	1200	33
20-55	1210	55	17-54	1545	50	4-52	0900	48	27-51	1430	34	12-53	1300	43	1-53	1230	32
5-56	1800	59	22-55	1450	55	29-52	1355	48	27-52	1635	38	5-59	1700	32	7-54	1400	32
25-56	1300	72	22-56	1700	58	9-53	1100	53	6-53	1630	55	2 -60	1520	33	21-61	1300	33
18-58	1400	61	12-57	1300	62	13-54	1630	53	29-54	1430	36	21-61	1430	33	11-62	1100	33
21-59	1930	70	21-58	1200	71	21-56	0900	47	3-55	1230	43	6-62	1200	35	3-63	1000	32
14-60	1725	60	26-60	1430	48	26-57	1130	52	1-56	1735	44	6-63	1230	35	7-65	1200	32
26-61	1405	64	21-53	1630	55	18-58	1630	50	26-56	1230	39	24-64	1200	32			
31-62	1100	56	23-65	1400	47	17-59	1200	54	15-57	1330	44	10-65	1230	34			
2-63	1430	53				28-60	1130	54	15-58	1300	41						
25-63	1215	58				5-61	1445	54	18-61	1200	37						
29-64	1130	45				11-62	1100	44	6-62	1400	48						
15-65	1000	54				1-64	1130	58	6-63	1645	48						
									10-64	1330	42						
									2-65	1200	44						

SMITH RIVER BASIN

78. Tenderfoot Creek near Neihart, Mont.

Location.--At thermograph site, lat 46°56', long 110°54', in SE¼ sec.36, T.14 N., R.6 E., on left bank 100 ft upstream from Stringen Creek and 7½ miles west of Neihart. Altitude of gage is 6,700 ft (from topographic map).

Water temperature records available.--Thermograph records during period August to November 1963 published in this report.

Extremes.--Water temperatures 1963: Maximum recorded, 56°F Aug. 15, 1963; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.

Water temperatures (°F), August to November 1963

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
August																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	56	53	54	53	55	51	51	51	53	54	53	52	51	50	47	51	48	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	42	42	43	44	43	41	40	41	43	44	42	41	40	40	40	42	--
September																																
Maximum.....	48	50	51	52	53	53	53	51	52	52	52	53	49	46	46	44	45	47	48	49	49	49	47	46	47	47	48	47	47	48	--	49
Minimum.....	45	44	42	40	42	42	42	44	44	43	45	43	45	42	38	39	38	38	42	39	44	42	43	38	39	39	39	39	39	40	--	41
October																																
Maximum.....	47	46	46	46	47	44	44	45	43	45	45	44	43	42	42	42	40	40	40	41	40	42	39	35	35	32	32	33	34	33	32	41
Minimum.....	41	38	39	40	41	42	38	37	40	41	39	38	37	37	36	35	35	35	39	37	36	38	33	33	32	32	32	32	32	32	32	36
November																																
Maximum.....	33	33	33	33	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	32	32	32	32	32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	--	--	--	--	--	--	56	53	47	--	--
	Min	--	--	--	--	--	--	--	40	38	32	32	--

SMITH RIVER BASIN

79. Tenderfoot Creek near Monarch, Mont.

Location.--At thermograph site, lat 46°57', long 111°09', in NW¼ sec.30, T.14 N., R.5 E., on right bank, a quarter of a mile upstream from South Fork and 18 miles southwest of Monarch. Altitude of gage is 5,850 ft (from topographic map).

Water temperature records available.--Thermograph records during periods July to October 1962, August to September 1963 published in this report.

Extremes.--Water temperatures 1962, 1963: Maximum recorded, 68°F July 15, 1962; minimum recorded, 41°F Oct. 17, 23, 1962; probably goes to freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), July to October 1962																																
July																																
Maximum.....	--	--	--	--	--	60	60	60	61	62	63	60	54	56	68	59	62	55	60	59	63	64	65	64	62	61	63	63	59	64	64	--
Minimum.....	--	--	--	--	--	--	50	49	51	52	51	52	52	--	49	50	50	51	49	50	50	51	52	53	53	54	53	53	54	52	53	--
August																																
Maximum.....	64	63	63	60	60	59	62	61	61	64	65	65	65	65	--	64	60	62	60	63	61	55	58	60	61	61	56	53	53	56	56	61
Minimum.....	53	53	--	54	52	51	52	--	54	52	53	54	54	53	54	--	55	54	53	52	54	54	51	50	51	52	52	51	50	48	48	52
September																																
Maximum.....	58	52	53	55	56	56	49	49	52	51	51	51	50	53	53	52	53	54	54	54	51	53	52	54	53	53	53	53	50	49	-	53
Minimum.....	49	50	57	45	47	48	48	45	42	46	48	46	47	48	47	45	45	46	48	47	48	48	47	47	47	46	46	48	47	43	-	47
October																																
Maximum.....	--	--	--	--	--	48	47	48	49	48	--	--	--	--	--	44	44	45	45	45	46	45	44	--	--	--	--	--	--	--	--	--
Minimum.....	44	--	--	--	--	45	45	45	46	44	--	--	--	--	--	--	41	42	43	42	42	43	41	--	--	--	--	--	--	--	--	--
Water temperatures (°F), August, September 1963																																
August																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64	62	62	63	62	59	60	60	62	62	61	--	60	60	57	60	56	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	52	52	52	53	53	51	50	51	52	52	--	--	50	50	50	51	--
September																																
Maximum.....	55	56	59	--	--	--	--	--	--	--	--	61	50	54	56	55	53	54	56	56	54	51	52	--	--	--	--	--	--	--	-	--
Minimum.....	53	52	50	50	--	--	--	--	--	--	--	--	48	51	50	51	47	47	50	48	51	47	48	47	--	--	--	--	--	--	-	--

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max	--	--	--	--	--	--	68	65	58	49	--	--
	Min	--	--	--	--	--	--	49	48	42	41	--	--
1963	Max	--	--	--	--	--	--	--	64	61	--	--	--
	Min	--	--	--	--	--	--	--	50	47	--	--	--

80. Smith River near Eden, Mont. (6-0775)

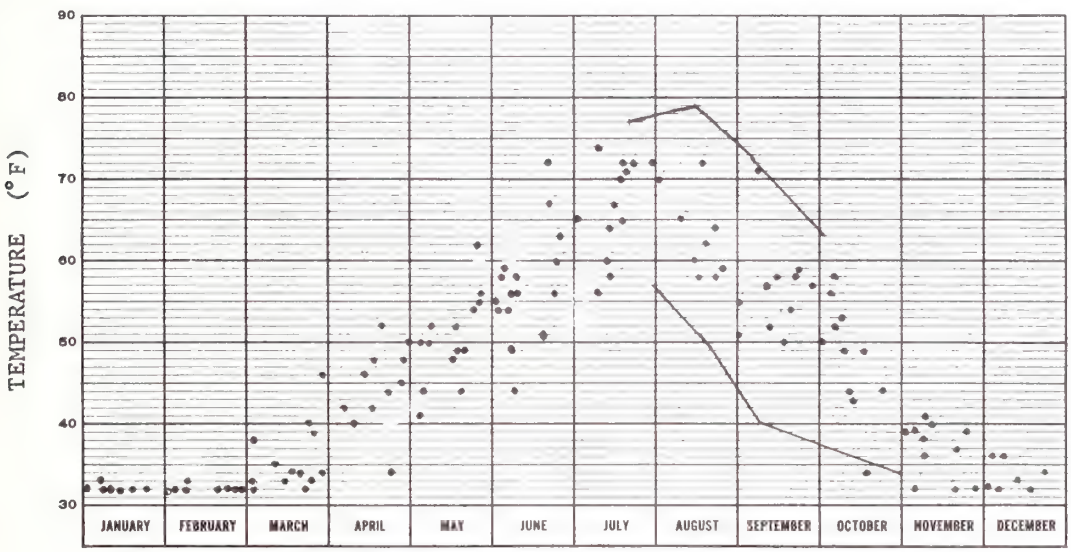
Location.--At gaging station, lat 47°12', long 111°23', in SW¼SW¼ sec.29, T.17 N., R.3 E., on left bank a quarter of a mile upstream from Mullens Creek, 2 miles upstream from Hound Creek, and 7 miles southwest of Eden. Altitude of gage is 3,500 ft (by barometer).

Drainage area.--1,594 sq mi.

Water temperature records available.--136 spot observations made at time of discharge measurements during period May 1951 to December 1965. Thermograph record on a seasonal basis (July to October) during period July 1962 to September 1964 published in this report.

Extremes.--Discharge 1951-65: Maximum, 12,300 cfs June 4, 1953; minimum observed, 3.1 cfs Sept. 1, 1961.
Water temperatures 1951-65: Maximum, 79°F Aug. 13, 14, 1963; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1951-65.
The lines delineate the range between the highest and lowest temperature from seasonal thermograph record, 1962-64.

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max	--	--	--	--	--	--	--	73	64	57	--	--
	Min	--	--	--	--	--	--	57	50	40	42	--	--
1963	Max	--	--	--	--	--	--	77	79	73	63	--	--
	Min	--	--	--	--	--	--	58	58	53	34	--	--
1964	Max	--	--	--	--	--	--	77	73	60	--	--	--
	Min	--	--	--	--	--	--	61	49	42	--	--	--

Extremes for years 1962-64

	Max	--	--	--	--	--	--	--	77	79	73	63	--	--
	Min	--	--	--	--	--	--	--	57	49	40	34	--	--

80. Smith River near Eden, Mont. (6-0775)

Temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
28-52	1530	32	21-52	1500	32	21-52	1000	32	5-52	1230	42	19-51	1030	48	20-51	1130	51
23-53	1200	32	25-53	1500	32	31-53	1330	46	15-52	1530	46	29-52	1200	56	12-53	1230	56
3-55	1430	32	5-54	1230	32	16-55	1330	33	29-53	1200	45	22-54	1500	49	9-54	1000	44
7-58	1330	32	4-55	1530	32	28-57	1330	40	26-55	1430	34	24-55	1500	44	14-55	0925	58
5-61	0920	32	1-61	0940	32	13-58	1400	35	11-56	1500	40	10-56	1900	50	26-56	1300	60
5-63	1600	33	28-61	0830	32	25-59	1100	40	22-58	1130	42	25-56	1630	54	6-57	1130	59
9-64	1600	32	27-62	1100	32	27-61	1330	34	30-59	1200	50	8-57	1200	50	13-58	1200	56
13-65	1235	32	8-63	1315	33	25-62	1500	34	27-61	1050	44	5-60	1735	41	2-60	1630	58
			3-64	1100	32	2-63	1710	38	26-62	1600	52	13-60	1815	52	1-61	1050	55
			4-65	1150	33	30-63	1000	39	22-63	1700	48	28-61	1635	62	20-61	1200	72
						1-64	1535	33	29-65	1400	48	24-62	1300	49	22-62	1535	67
						27-64	0905	33				20-63	1705	52	7-63	1200	54
						1-65	1030	32				28-63	0910	55	10-64	1030	49
						31-65	1600	34				7-64	1415	44	27-64	1250	63
															3-65	1635	54
															23-65	1100	56
July			August			September			October			November			December		
11-51	1100	56	17-51	0930	60	21-51	1200	58	18-51	1400	34	12-51	1500	36	19-52	1300	32
17-52	1400	67	22-52	1200	62	23-52	1530	59	14-52	1440	43	13-53	0900	40	3-53	1400	36
15-54	1530	60	18-54	1000	58	11-53	1230	57	7-53	1300	58	29-54	1230	32	1-60	1610	32
21-55	1600	65	23-55	1050	64	14-54	1000	58	25-56	1500	44	26-57	1130	39	22-61	1635	34
24-56	1700	71	13-57	1000	65	20-56	1330	54	16-57	1100	49	6-59	1230	32	11-62	1630	33
16-58	1030	58	19-58	1400	72	17-58	1630	50	13-58	1400	44	1-60	1110	39	3-63	1700	32
21-59	1030	70	25-60	1345	58	18-59	1030	54	10-61	1700	49	21-61	0900	32	6-65	1500	36
13-60	1400	74	1-62	1200	70	29-60	1510	57	7-62	1600	52	7-62	1200	38			
25-61	1830	72	24-65	1430	59	1-61	1035	55	4-63	1700	56	5-63	1600	39			
1-63	1920	65				12-62	1000	52	11-64	1600	53	24-64	1730	37			
23-63	1215	72				7-63	1730	71	1-65	1500	50	9-65	1430	41			
31-64	1600	72				1-64	1700	51									
16-65	0930	64															

80. Smith River near Eden, Mont. (6-0775)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), July to October 1962																																
July																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	75	73	71	71	63	70	--	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66	66	62	62	61	57	--	--
August																																
Maximum.....	--	--	70	68	65	67	67	70	68	67	70	72	73	72	72	70	67	65	65	69	67	62	62	63	64	66	60	55	57	60	60	66
Minimum.....	--	--	63	63	62	56	60	59	60	59	57	60	63	62	60	60	61	58	58	57	60	55	53	54	55	57	55	52	51	50	53	58
September																																
Maximum.....	64	58	54	58	61	63	57	48	53	51	59	55	52	52	58	58	59	60	61	60	57	61	60	62	62	62	60	60	56	56	-	58
Minimum.....	52	48	46	45	49	52	43	40	40	47	48	47	50	50	48	48	48	50	52	51	52	52	53	53	53	53	53	54	51	47	-	49
October																																
Maximum.....	--	57	57	57	53	52	52	52	52	48	--	--	--	--	48	48	48	47	50	49	49	47	48	--	--	--	--	--	--	--	--	--
Minimum.....	--	--	50	50	49	48	47	47	45	46	--	--	--	--	--	43	42	45	44	45	46	45	42	--	--	--	--	--	--	--	--	--
Water temperatures (°F), July to October 1963																																
July																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	68	68	68	66	70	72	75	76	77	76	73	72	71	70	72	73	73	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	59	60	59	58	62	64	65	65	66	64	63	59	61	61	63	60	--
August																																
Maximum.....	72	72	74	74	74	76	78	78	78	78	73	76	79	79	76	73	73	70	--	--	--	--	--	--	--	--	--	--	69	70	67	--
Minimum.....	63	60	60	64	63	64	66	68	66	69	68	64	66	67	63	60	60	61	--	--	--	--	--	--	--	--	--	--	58	58	59	--
September																																
Maximum.....	63	64	67	69	70	73	72	64	70	71	66	--	--	--	--	-	--	61	64	63	62	65	62	62	--	64	64	64	64	63	-	--
Minimum.....	61	58	57	58	60	--	60	60	60	60	63	--	--	--	--	--	--	--	55	53	56	56	57	53	--	54	55	54	54	55	-	--
October																																
Maximum.....	63	--	--	--	--	--	--	--	--	--	--	58	57	58	57	56	55	54	51	52	51	54	51	47	50	44	41	43	45	42	40	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	50	50	49	49	48	48	48	45	47	48	46	42	41	38	38	36	41	38	34	--
Water temperatures (°F), July to September 1964																																
July																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	72	71	71	74	73	74	75	77	76	74	73	73	--	--	--	--	72	71	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	69	62	61	62	65	65	62	65	66	65	62	61	--	--	--	--	--	62	--
August																																
Maximum.....	68	68	71	73	72	71	70	72	73	70	70	68	69	71	70	72	72	72	66	55	62	65	62	61	60	59	60	58	--	--	--	--
Minimum.....	62	58	59	62	62	59	59	63	63	62	58	59	61	59	--	59	59	63	49	53	53	49	57	54	52	55	54	55	--	--	--	--
September																																
Maximum.....	--	--	--	60	56	50	52	57	60	54	55	56	58	58	59	60	60	54	--	--	56	53	55	59	55	50	50	51	--	--	-	--
Minimum.....	--	--	--	--	50	49	49	50	53	49	48	45	47	48	50	50	52	49	--	--	--	49	49	49	47	44	42	45	46	--	-	--

81. Missouri River near Ulm, Mont. (6-0782)

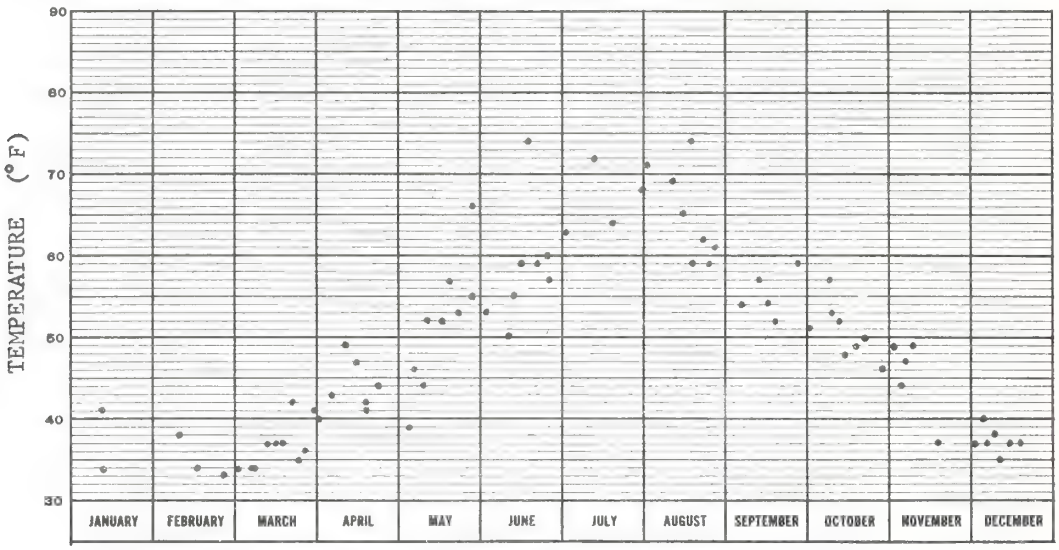
Location.--At gaging station, lat 47°26'10", long 111°23'10", in NW¼NW¼ sec.5, T.19 N., R.3 E., on left bank 6 miles east of Ulm and 9 miles downstream from Smith River. Altitude of gage is 3,310 ft (from topographic map).

Drainage area.--20,941 sq mi.

Water temperature records available.--76 spot observations made at time of discharge measurements during period August 1957 to December 1965.

Extremes.--Discharge 1957-65: Maximum, 27,500 cfs June 22, 1964; minimum daily, 1,700 cfs June 17, 1961. Flood in June 1953 reached a stage of about 17 ft (discharge, 35,000 cfs); flood in June 1948 reached a stage of about 16 ft (discharge, 32,000 cfs).

Water temperatures 1957-65: Maximum observed, 74°F Aug. 20, 1958, June 20, 1961; minimum freezing point on many days during winter months.



Spot observations of water temperatures, 1957-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-58	1300	41	9-61	1205	38	14-58	1200	37	23-58	1100	41	13-58	1600	52	18-59	1330	59
8-63	0845	34	28-61	1230	33	26-59	1200	42	12-61	1455	49	29-61	1225	66	20-61	1550	74
			19-62	1430	34	27-61	1800	35	26-61	1650	44	9-62	1100	52	27-62	1700	57
						29-62	1700	36	1-63	1210	40	4-63	0800	46	27-63	0730	60
						4-63	0815	34	23-63	0715	42	21-63	0645	53	2-64	1010	53
						1-64	1625	34	19-64	1325	47	6-64	0940	44	10-64	1100	50
						9-64	1530	37	6-65	1340	43	20-64	1340	57	12-64	1300	55
						12-64	1530	37				3-65	1830	39	26-64	1530	59
						31-64	1805	41				29-65	1200	55			
						4-65	1300	34									
July			August			September			October			November			December		
10-61	1530	72	13-57	1430	65	18-58	1200	52	16-57	1630	49	2-60	1015	44	10-59	1200	37
31-62	1830	68	20-58	1500	74	17-59	1700	54	14-58	1230	48	20-61	1600	37	1-60	1020	37
24-63	0950	64	20-59	1030	59	30-60	1000	59	17-61	1600	50	5-62	0800	49	5-61	1400	35
1-65	1830	63	25-60	1825	61	14-61	1100	57	30-61	1430	46	3-63	1800	47	3-62	0825	37
			1-61	2030	71	8-62	1120	53	8-62	1100	53	1-64	0930	49	12-62	0930	37
			10-62	1045	69				6-63	1100	57				4-63	1230	38
			22-63	0800	62				11-64	1230	52				3-65	1530	40
			24-65	1100	59				1-65	1330	51						

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

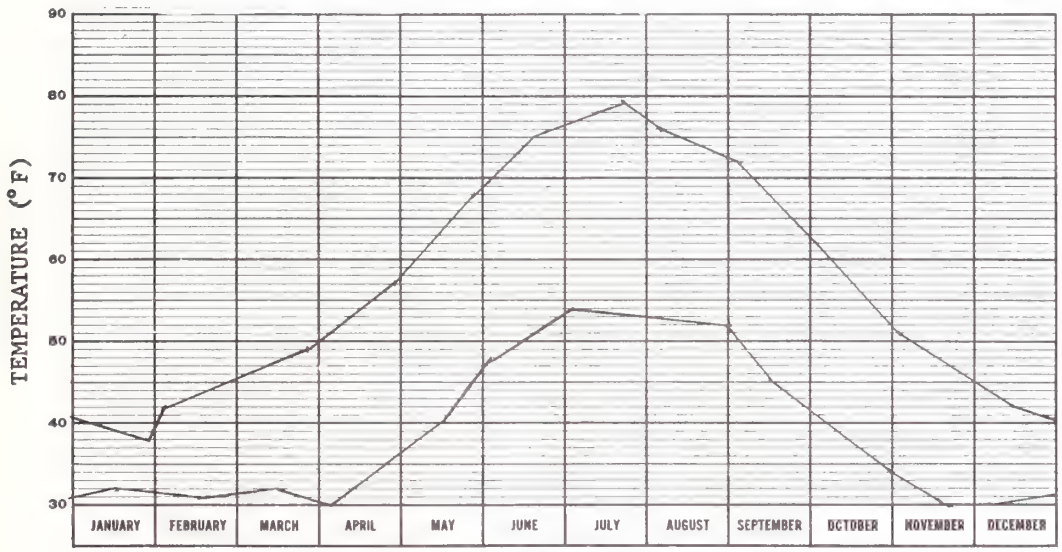
Location.--Lat 47°29'30", long 111°18'20", near center of NW¼NE¼ sec.14, T.20 N., R.3 E., on right bank at intake for city of Great Falls water works, 800 ft upstream from mouth of Sun River. Altitude is 3,340 ft (from topographic map).

Drainage area.--20,680 sq mi.

Water temperature records available.--Once-daily temperature readings taken at 0800 hours by city of Great Falls water department during period October 1937 to December 1965.

Extremes.--Water temperatures 1937-65: Maximum observed, 79°F July 19, 1941; minimum, freezing point on many days during winter months.

Cooperation.--Records furnished by city of Great Falls.



The lines connect the highest and lowest monthly temperatures from once-daily observations, 1937-65

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), October to December 1937																																
October.....	52	53	54	53	53	51	51	51	53	54	54	52	51	50	50	50	50	50	50	48	48	48	50	52	52	52	51	51	51	51	51	51
November.....	51	50	48	45	45	45	45	42	43	43	44	44	44	43	43	40	38	37	37	36	36	36	38	40	40	39	38	36	35	35	-	41
December.....	35	36	36	36	35	36	35	34	34	33	34	34	34	33	34	34	34	34	34	34	34	33	33	33	33	33	33	34	34	34	34	34
Water temperatures (°F), calendar year 1938																																
January.....	34	--	--	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	33	34	33	34	34	34	33	33	34	34	34
February.....	34	34	34	35	35	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	33	-	-	-	33
March.....	33	33	34	34	33	33	33	34	34	34	34	34	35	40	41	42	42	40	38	38	36	36	37	37	36	46	41	41	41	39	34	37
April.....	34	35	36	38	40	42	42	42	44	46	46	48	48	47	48	48	48	50	50	47	48	48	47	48	48	46	43	46	47	52	-	45
May.....	50	50	48	48	48	48	48	48	48	48	50	48	48	48	52	54	52	54	49	48	49	51	56	52	56	56	57	58	58	58	56	51
June.....	58	58	59	60	60	62	60	59	60	59	58	60	62	64	62	62	63	63	63	62	64	66	66	62	63	61	64	64	64	63	-	62
July.....	66	64	64	64	64	64	64	66	66	66	67	67	68	68	69	69	71	70	71	71	71	73	73	73	66	66	66	68	70	70	70	68
August.....	70	69	66	67	68	68	68	69	69	68	69	69	69	68	66	64	64	65	64	64	65	64	64	66	66	68	68	68	69	69	70	67
September....	69	66	67	68	68	67	67	66	62	62	61	61	61	54	54	64	65	65	64	65	64	66	64	64	64	63	62	62	62	61	-	64
October.....	62	62	60	60	59	56	54	55	56	55	55	53	51	50	49	49	46	46	46	47	48	49	49	48	49	49	49	49	49	49	50	52
November.....	50	49	46	44	43	42	42	42	40	40	40	40	38	38	38	40	42	44	40	42	38	36	34	33	33	33	33	33	37	35	-	40
December.....	37	37	36	35	36	36	36	36	37	38	38	36	38	38	38	40	38	36	33	33	33	33	33	33	33	33	33	33	32	33	33	35
Water temperatures (°F), calendar year 1939																																
January.....	33	32	32	32	33	32	32	33	33	36	38	38	38	38	38	32	32	32	32	32	32	32	33	33	33	33	33	33	38	34	33	35
February.....	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	32	32	32	32	32	32	34	34	-	-	-	33
March.....	34	34	34	34	34	32	32	32	33	33	33	33	33	33	33	33	33	33	32	32	40	44	43	41	43	41	40	36	38	40	42	36
April.....	42	42	42	48	46	42	44	44	42	42	42	42	42	43	43	42	45	45	45	46	50	52	52	54	52	52	54	54	57	56	-	47
May.....	56	57	58	60	60	58	57	52	54	54	54	54	56	56	65	65	64	64	63	59	60	60	58	56	58	60	64	64	64	66	66	59
June.....	66	66	52	64	63	59	58	58	60	60	60	63	63	61	61	61	61	58	58	58	58	60	64	64	64	64	66	66	68	70	-	62
July.....	70	70	71	70	68	64	66	68	70	74	75	74	74	74	74	73	70	69	70	69	68	68	70	70	72	74	76	78	76	76	74	71
August.....	72	72	73	74	74	74	66	64	64	62	64	68	69	70	72	72	72	72	72	72	72	72	70	70	69	70	70	71	70	68	68	70
September....	67	66	66	64	66	64	63	63	62	63	64	62	60	62	58	59	60	60	62	62	64	66	64	64	60	58	57	55	53	52	-	62
October.....	54	53	53	53	53	51	50	50	50	50	50	52	53	53	52	52	53	53	51	51	52	52	50	50	47	43	41	42	42	46	47	50
November.....	45	45	47	45	46	43	42	42	42	40	40	40	43	44	44	44	44	45	45	41	40	40	40	40	39	39	39	36	37	37	-	42
December.....	38	39	38	39	39	40	40	40	40	40	40	42	41	40	40	42	42	40	39	38	36	36	32	32	32	32	32	32	32	32	31	37

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1940																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	-	-	32
March.....	34	34	34	34	34	34	34	34	35	36	38	36	37	37	38	39	40	40	40	40	40	42	42	42	38	37	40	40	42	44	44	38
April.....	46	48	48	48	46	46	48	48	44	43	42	40	42	42	48	48	47	49	50	50	45	54	48	50	48	46	46	48	50	50	-	47
May.....	51	54	56	56	56	53	52	53	58	59	60	60	59	59	59	59	58	59	59	55	60	60	63	64	65	64	64	64	64	64	66	59
June.....	68	66	66	66	67	68	66	64	61	63	67	70	71	68	69	68	68	70	70	72	72	70	70	68	69	71	68	70	72	72	-	68
July.....	70	70	71	73	72	72	76	74	75	74	73	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	72	72	72	70	72	73
August.....	72	73	72	72	69	69	70	71	72	72	73	74	74	74	74	72	70	72	72	72	72	70	68	68	68	70	70	68	68	68	69	71
September....	69	71	72	70	66	66	66	65	68	70	70	70	70	70	70	68	68	68	65	67	65	69	64	63	62	63	63	63	63	62	-	67
October.....	60	62	58	57	57	55	57	57	57	58	57	55	55	54	54	54	54	54	54	55	55	55	55	55	55	47	46	47	48	48	48	54
November.....	48	48	46	47	42	42	42	42	38	37	40	38	40	40	40	40	40	40	39	38	37	36	33	34	34	35	35	36	38	37	-	39
December.....	37	36	36	36	36	36	36	36	36	40	40	40	36	36	36	33	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	35
Water temperatures (°F), calendar year 1941																																
January.....	34	34	34	34	34	34	34	34	34	34	34	34	34	33	33	33	33	33	33	34	34	34	34	33	33	33	33	32	33	33	33	34
February.....	33	33	42	42	42	42	42	38	40	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	-	-	-	36
March.....	34	34	34	34	34	34	36	36	36	40	38	37	37	37	35	34	34	37	38	38	42	43	42	42	42	44	34	34	44			38
April.....	46	48	48	48	48	48	46	46	48	48	48	48	48	49	49	4	49	44	45	45	48	48	50	50	50	50	50	52	54	56	-	49
May.....	56	58	57	58	58	56	56	56	56	56	61	64	63	62	61	59	61	59	59	59	59	60	62	63	63	62	62	58	59	62	63	60
June.....	60	62	62	62	60	60	60	62	62	61	62	62	62	63	63	64	63	68	64	64	63	65	70	70	70	70	70	68	65	65	-	64
July.....	65	68	70	72	75	75	75	72	73	72	70	70	72	73	74	73	75	75	79	76	72	70	70	68	68	70	70	70	70	70	70	69
August.....	70	70	70	70	72	72	74	74	74	73	73	73	70	70	70	72	70	70	70	70	70	70	70	66	64	62	60	60	60	60	65	69
September....	60	62	63	62	60	60	68	56	54	54	54	54	54	58	52	50	50	52	54	56	54	54	54	54	52	51	50	50	48	48	-	55
October.....	48	48	48	48	48	42	42	42	42	42	42	42	44	44	44	45	45	45	45	45	45	45	45	45	45	48	45	45	40	38	38	44
November.....	38	38	37	37	38	38	36	36	36	36	38	38	38	38	38	38	38	30	36	34	34	34	34	34	34	34	34	34	34	34	-	36
December.....	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	33	33	33	33	32	32	32	32	34
Water temperatures (°F), calendar year 1942																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	32	32	32	32	32	32	35	35	32
April.....	35	35	35	35	35	38	38	38	38	37	38	38	40	40	40	40	40	40	42	42	42	46	46	46	46	46	46	46	46	45	-	41
May.....	46	46	46	50	53	54	54	56	58	58	58	58	54	52	52	49	48	54	56	58	60	58	60	62	59	59	56	56	54	52	52	54
June.....	56	58	58	59	59	59	61	60	61	61	60	58	58	58	64	60	60	60	60	60	60	60	60	62	62	61	60	60	60	60	-	60
July.....	66	68	68	68	70	74	71	72	72	72	72	70	74	74	74	74	74	74	74	73	73	73	72	72	73	73	70	70	70	71	71	72
August.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
September....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
October.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	42	42	--
November.....	42	42	44	42	40	40	40	40	40	40	40	40	40	40	40	40	40	37	35	35	34	34	34	40	38	37	37	37	32	32	-	38
December.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	36	34	32	32	34	34	32	32	32	32	32	32	32	32	32	32

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1943																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	36	36	32
April.....	36	38	38	38	39	38	38	38	38	38	38	--	--	44	44	42	44	44	46	46	46	45	48	48	48	46	46	44	48	45	-	43
May.....	46	48	52	52	52	49	50	48	50	50	46	44	48	48	48	48	50	50	54	55	56	56	56	52	55	55	56	60	60	58	56	52
June.....	56	56	52	48	52	54	55	55	55	56	55	55	53	52	52	54	56	58	60	58	58	60	60	59	60	62	62	63	63	64	-	57
July.....	64	64	64	64	64	66	67	68	69	68	68	66	62	62	66	66	66	68	68	69	70	71	71	71	71	70	70	70	70	70	70	68
August.....	70	70	66	68	68	70	70	68	66	68	67	67	66	66	66	68	68	68	70	70	70	68	66	66	66	66	68	66	66	66	66	68
September....	66	60	60	60	59	60	59	59	58	60	62	62	62	62	60	58	60	58	56	54	54	56	58	58	58	58	62	60	59	59	-	59
October.....	58	58	58	58	58	58	58	58	58	58	56	58	54	52	52	52	52	50	50	48	48	56	47	47	48	48	50	51	50	50	46	53
November.....	44	41	43	41	41	41	40	40	42	42	42	41	42	42	42	42	42	42	42	42	42	42	40	40	38	35	34	35	36	38	-	40
December.....	38	38	38	38	38	36	34	34	34	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
Water temperatures (°F), calendar year 1944																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	34	34	34	34	34	34	34	34	34	34	33
April.....	34	38	40	40	44	44	42	40	42	42	42	42	44	44	44	44	46	43	42	45	45	45	45	--	48	47	47	48	50	50	-	44
May.....	50	46	48	46	50	52	52	53	53	53	54	54	58	58	60	60	60	59	56	56	56	54	53	53	54	56	58	58	62	66	62	55
June.....	62	62	60	60	55	55	58	58	56	56	58	60	60	57	60	58	58	58	59	59	59	58	60	60	61	62	60	60	60	62	-	59
July.....	64	62	62	62	65	64	64	64	64	65	65	66	68	68	68	68	68	70	70	71	71	71	71	71	70	70	70	70	70	70	69	67
August.....	69	69	67	68	68	69	70	70	70	64	66	68	68	62	60	59	60	64	66	66	67	67	66	67	67	67	67	67	66	65	66	66
September....	58	58	66	64	65	66	67	68	68	68	66	66	66	63	58	56	54	55	55	54	55	57	60	60	60	60	56	57	57	54	-	61
October.....	51	52	51	54	54	51	51	51	53	52	52	52	52	54	54	52	52	51	51	52	50	50	50	50	50	50	50	50	50	48	50	51
November.....	51	47	44	43	44	42	42	42	44	42	41	41	41	41	40	40	40	39	40	38	38	38	40	40	40	38	37	37	36	34	-	41
December.....	35	37	38	36	36	36	39	37	37	37	32	33	33	34	34	34	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34
Water temperatures (°F), calendar year 1945																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	32	36	36	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	34	34	35	35	36	35	35	38	38	42	42	43	40	40	40	40	40	41	36
April.....	40	36	40	36	38	40	40	42	42	41	41	40	41	41	41	40	41	41	43	44	45	46	46	46	42	40	42	46	47	49	-	42
May.....	50	50	50	54	54	50	51	51	50	50	50	50	52	50	50	50	53	53	54	50	51	51	55	55	56	56	56	54	54	56	54	52
June.....	60	58	59	66	55	54	52	52	54	56	57	57	55	54	54	56	57	58	60	60	62	64	64	64	62	64	62	60	58	52	-	58
July.....	60	64	66	66	64	67	67	68	68	68	68	68	72	71	70	71	68	66	67	68	68	68	73	72	73	74	75	75	75	71	68	69
August.....	68	69	71	72	71	71	72	71	68	68	70	70	70	70	69	71	73	72	71	68	68	68	68	70	70	70	64	64	58	68	66	69
September....	64	66	66	66	64	64	62	62	60	58	58	57	58	58	60	60	58	54	53	52	53	50	48	49	49	51	46	51	51	52	-	57
October.....	52	53	56	56	56	56	55	52	52	52	54	54	54	54	55	55	54	50	50	50	48	45	45	42	44	44	46	47	45	46	46	51
November.....	45	44	43	44	43	43	42	35	33	33	32	36	36	38	37	38	38	38	36	36	36	36	36	32	37	37	37	37	39	38	-	38
December.....	37	36	33	33	35	36	35	33	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32	33

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																												Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1946																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	33	34	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	34	-	-	-	32
March.....	34	36	36	34	36	36	34	34	34	34	39	39	39	40	36	36	39	38	38	40	40	38	38	39	36	39	41	44	42	41	41	38
April.....	39	39	41	41	41	42	42	45	45	44	36	47	47	48	48	48	48	50	51	50	50	50	50	51	50	51	51	52	52	51	-	47
May.....	50	50	51	54	54	52	50	52	53	50	48	52	52	54	52	56	58	56	54	55	56	55	57	57	58	62	60	60	59	54	55	54
June.....	56	56	61	62	62	62	58	59	61	64	64	64	62	65	65	64	61	59	60	64	66	66	66	62	62	60	61	61	61	61	-	62
July.....	66	70	69	70	70	70	71	68	66	64	68	68	72	70	70	70	71	70	71	72	74	73	70	70	68	72	72	72	71	71	69	70
August.....	66	68	68	69	73	73	66	66	66	68	68	71	70	70	66	66	63	67	68	68	72	70	71	70	68	66	63	60	61	61	62	67
September....	63	66	67	67	62	60	58	57	56	58	60	62	62	62	62	62	61	56	57	56	55	54	54	56	56	58	58	56	57	64	-	59
October.....	56	56	52	52	52	50	48	49	48	47	46	46	45	45	45	44	42	45	46	47	46	46	46	46	44	43	43	43	43	38	43	47
November.....	40	39	39	40	40	41	42	40	40	40	38	36	38	36	36	35	34	33	32	32	33	32	34	32	35	33	33	32	33	33	-	36
December.....	33	33	32	32	34	32	32	32	32	33	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Water temperatures (°F), calendar year 1947																																
January.....	32	32	32	32	32	32	32	32	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	32	-	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	36	38	40	38	37	38	38	38	38	40	40	42	35
April.....	42	44	40	40	38	38	36	44	40	41	42	42	43	46	46	44	45	46	46	46	46	45	42	44	46	48	50	52	52	51	-	44
May.....	52	50	52	54	54	54	54	54	55	54	54	56	56	56	56	56	56	56	56	56	56	56	55	56	58	68	68	56	63	64	64	57
June.....	69	57	60	60	60	60	60	60	60	58	57	56	56	58	60	59	59	60	61	62	64	60	60	60	62	62	60	60	60	60	-	60
July.....	62	62	66	65	66	68	68	67	68	68	68	68	68	68	68	73	68	69	69	70	70	72	71	71	70	70	70	73	72	72	71	69
August.....	72	72	73	72	70	70	71	70	70	70	66	68	68	67	66	68	68	69	69	68	68	69	64	63	62	63	64	65	65	66	69	68
September....	64	68	64	66	67	66	64	62	60	60	58	60	58	58	56	58	50	50	47	58	58	58	60	60	60	60	60	59	59	56	-	59
October.....	57	57	56	58	58	58	55	55	51	53	51	51	53	54	54	54	51	50	51	52	52	50	48	48	49	50	48	50	49	50	49	52
November.....	48	48	48	46	44	42	42	42	42	42	42	44	40	40	40	38	36	36	36	37	36	34	34	35	36	38	40	38	36	36	-	40
December.....	36	36	34	33	33	33	33	33	32	32	32	32	32	32	32	32	34	34	34	34	33	32	32	32	34	36	36	35	34	33	32	33
Water temperatures (°F), calendar year 1948																																
January.....	34	33	32	32	32	33	33	34	34	32	32	34	32	32	32	32	32	32	32	32	32	33	33	34	32	32	33	32	32	32	32	33
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	34	32	32	32	32	34	38	39	39	36	33
April.....	38	38	39	39	37	37	38	36	40	41	48	38	39	41	40	44	46	46	46	46	45	48	44	45	46	46	45	47	46	48	-	43
May.....	48	48	48	48	49	50	51	51	48	48	47	50	52	52	52	53	55	57	56	54	54	54	54	56	57	60	58	58	58	58	58	53
June.....	61	63	62	62	62	62	65	65	68	64	61	61	63	65	66	65	63	63	62	63	64	64	63	62	62	62	63	63	63	68	-	63
July.....	66	66	66	66	67	68	68	68	68	69	69	69	69	70	68	69	69	69	68	68	66	68	68	70	70	68	70	70	64	64	66	68
August.....	69	70	68	70	70	71	69	70	70	70	68	69	68	67	70	72	72	72	70	66	66	66	68	66	64	65	65	65	66	68	68	68
September....	68	68	68	66	66	64	64	64	62	62	62	63	64	64	64	62	60	60	60	60	59	59	60	59	54	54	54	56	56	56	-	61
October.....	56	56	57	57	54	51	50	50	50	50	50	50	54	54	54	48	46	46	46	46	46	48	48	50	49	48	48	48	48	47	47	50
November.....	47	46	46	42	42	42	41	39	35	40	38	40	39	40	41	40	38	38	37	38	38	38	38	36	37	37	35	35	34	33	-	39
December.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1949																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	32	32	32	32	35	36	36	32
April.....	38	38	38	40	42	42	46	46	49	47	47	47	47	45	47	44	44	47	48	49	48	48	48	49	49	50	52	52	52	52	-	46
May.....	48	50	51	52	53	54	56	57	58	59	61	62	61	62	62	63	56	52	50	50	50	48	55	55	58	60	60	60	60	62	60	56
June.....	58	57	60	60	62	64	64	65	65	68	70	68	66	67	66	66	65	64	62	62	63	66	64	62	63	63	63	63	66	62	-	64
July.....	65	67	68	72	72	70	76	70	71	72	73	72	70	72	72	73	73	73	74	68	64	64	68	68	68	68	68	67	67	70	72	70
August.....	72	74	74	76	76	76	76	74	73	70	71	72	70	71	71	71	70	70	72	71	71	71	71	69	69	69	68	68	68	68	68	71
September....	69	69	66	65	63	62	60	62	65	64	58	56	53	56	56	50	56	54	54	54	58	58	59	61	62	61	60	59	59	60	-	60
October.....	60	58	57	54	55	51	50	49	49	47	49	48	48	48	48	48	48	42	44	--	--	--	--	--	--	--	--	--	--	--	--	--
November.....	46	45	44	44	44	45	45	44	46	42	41	41	42	42	40	46	41	41	41	41	41	40	40	42	42	42	43	41	39	38	-	42
December.....	37	37	37	36	36	35	34	34	34	34	32	33	32	33	32	32	32	32	32	32	33	32	32	32	32	32	32	33	32	32	32	33
Water temperatures (°F), calendar year 1950																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	33	33	32	32	32	32	32	-	-	-	32
March.....	33	32	32	32	32	32	34	33	33	32	32	32	32	32	33	32	32	32	34	35	39	36	35	36	35	36	37	38	37	38	38	34
April.....	40	40	40	38	38	42	42	42	40	41	43	44	46	46	45	44	44	46	46	45	46	46	46	42	43	43	43	41	41	40	-	43
May.....	41	45	44	42	45	48	48	48	48	47	49	55	56	57	56	55	53	56	55	54	55	55	55	54	50	51	55	56	55	55	55	52
June.....	56	57	58	58	62	61	55	50	50	55	58	60	58	57	59	59	58	59	59	71	62	62	58	58	58	56	60	65	66	67	-	59
July.....	67	67	67	67	68	68	72	70	70	70	67	66	68	69	68	67	66	66	67	68	67	68	68	69	71	70	70	72	70	72	72	69
August.....	72	68	71	68	69	68	67	66	68	65	65	68	67	66	66	67	66	66	62	62	64	68	68	68	66	66	66	68	68	68	68	67
September....	68	68	69	70	69	69	68	65	62	60	60	57	56	54	56	58	56	56	58	60	60	62	62	62	60	58	56	54	52	48	-	60
October.....	50	48	48	50	54	53	52	52	52	52	52	52	52	52	52	52	52	50	49	48	48	47	47	46	48	48	47	46	46	47	46	50
November.....	46	45	45	45	45	45	45	43	36	36	34	34	34	36	36	36	35	35	33	32	34	33	32	32	32	32	38	38	34	33	-	37
December.....	32	32	32	32	32	32	32	32	32	32	32	36	34	32	32	32	32	32	32	32	33	34	34	35	36	33	33	32	32	33	32	33
Water temperatures (°F), calendar year 1951																																
January.....	32	32	32	32	32	32	32	33	33	33	32	32	32	32	32	32	33	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	34	32	32	32	32	32	32	34	32	32	32	32	32	32	32	-	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	34	32	32	32	32	32	32	34	32	32	32	32	32	32	34	34	34	35	32
April.....	34	35	36	34	36	36	36	36	36	36	36	35	36	34	33	33	35	34	33	33	33	34	35	35	36	45	44	48	48	46	-	37
May.....	--	45	45	47	47	47	50	50	50	53	54	54	53	55	54	55	54	54	55	55	55	56	60	58	54	54	56	56	56	52	50	53
June.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
July.....	62	61	62	62	66	66	66	66	64	61	66	60	61	62	64	64	64	71	71	72	71	72	71	71	70	71	71	71	72	72	73	67
August.....	73	71	72	72	70	70	69	70	69	67	66	65	64	66	64	64	66	66	66	66	66	66	64	66	64	62	62	60	60	60	60	66
September....	61	61	59	59	62	62	62	62	62	62	61	60	56	56	56	56	58	58	62	55	55	55	55	54	54	58	56	50	50	49	-	58
October.....	53	53	60	56	54	56	54	55	55	59	56	56	52	50	54	46	45	42	41	42	43	42	42	50	50	51	44	46	44	43	40	49
November.....	38	37	37	37	42	41	41	40	41	42	42	41	41	40	38	38	38	38	37	37	33	34	32	32	33	33	34	34	35	34	-	37
December.....	35	37	34	34	34	38	30	38	32	34	36	34	32	32	32	32	32	32	32	34	32	32	32	32	32	32	32	32	32	32	32	33

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1952																															
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	34	34	34	35	34	34	36	38	38	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	33
March.....	32	32	32	32	37	33	33	34	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	34	32	34	36	36	40	33
April.....	38	39	40	42	42	45	42	41	38	44	44	44	45	45	45	45	44	44	45	45	44	45	45	50	37	52	54	56	54	52	-	46
May.....	52	54	54	54	54	54	54	56	56	56	57	59	58	58	56	56	55	54	54	55	58	56	58	58	58	58	58	52	60	58	48	56
June.....	48	60	62	62	63	64	62	64	62	62	62	62	60	60	61	60	60	60	64	64	64	61	61	60	60	62	62	62	64	64	-	61
July.....	64	64	64	66	67	66	64	64	64	72	71	70	70	70	71	71	68	71	64	66	62	62	64	68	68	68	68	68	68	70	72	67
August.....	72	72	72	72	72	72	68	68	67	65	66	65	68	68	68	58	64	66	60	68	68	70	70	70	72	70	68	64	64	62	59	67
September....	58	58	64	64	63	62	64	64	64	62	62	62	58	58	56	56	60	64	63	62	62	60	60	60	62	62	61	61	59	60	-	61
October.....	58	56	56	54	53	52	50	54	56	54	56	54	54	50	48	48	48	49	49	52	54	52	54	54	54	50	52	48	50	47	46	52
November.....	46	44	44	44	44	44	44	44	42	42	42	40	42	42	42	42	42	42	41	40	43	38	37	36	34	34	33	33	32	32	-	40
December.....	32	32	32	40	34	38	34	34	32	33	32	32	32	33	34	35	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
Water temperatures (°F), calendar year 1953																															
January.....	32	32	32	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	33	32	32	32	32	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	36	34	-	-	-	32
March.....	32	32	32	33	32	32	32	32	33	33	33	39	39	38	37	37	37	36	38	32	38	36	37	38	38	34	34	40	40	40	40	36
April.....	39	41	41	43	43	43	40	38	38	38	40	40	42	40	41	40	40	41	41	42	48	51	50	50	48	48	50	52	48	48	-	43
May.....	48	48	50	50	54	57	58	56	56	50	46	46	44	48	50	54	54	57	57	54	44	46	50	50	50	48	50	50	52	53	51	51
June.....	53	53	56	50	51	52	54	54	54	58	57	60	60	60	61	61	60	60	60	60	60	59	60	59	59	60	60	62	62	63	-	58
July.....	64	65	66	64	66	66	66	67	69	70	71	70	70	71	64	71	70	72	72	70	70	69	71	71	68	69	70	70	70	71	72	69
August.....	72	70	70	70	68	69	69	69	68	68	66	68	68	68	70	70	68	64	65	70	68	70	68	68	63	62	62	60	66	65	64	67
September....	67	64	63	62	62	62	64	63	66	62	62	62	62	64	62	64	62	62	61	59	58	58	59	58	58	56	56	56	56	55	-	61
October.....	53	53	52	53	52	52	54	56	54	54	52	54	54	52	52	51	54	53	52	51	50	50	46	46	46	46	53	48	48	48	47	51
November.....	48	48	46	44	42	38	46	38	45	44	48	48	47	47	47	46	46	46	41	41	39	39	39	39	39	39	39	39	40	39	-	43
December.....	39	40	38	38	38	40	36	36	36	36	36	36	36	36	35	34	34	33	36	32	36	33	32	35	35	36	34	33	32	33	33	35
Water temperatures (°F), calendar year 1954																															
January.....	34	36	36	34	34	34	34	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	33	33	38	38	38	38	38	-	-	-	32
March.....	34	32	36	33	33	33	33	38	40	40	38	38	34	35	33	33	36	35	38	36	35	35	36	38	34	36	34	32	32	32	32	35
April.....	33	32	32	39	44	45	42	42	43	43	44	44	44	46	43	53	53	52	52	52	52	36	34	42	44	38	36	42	41	40	-	43
May.....	40	40	42	48	49	42	52	53	54	56	56	55	54	54	54	54	55	57	62	60	61	60	56	56	56	56	57	56	58	58	58	54
June.....	56	52	53	56	59	60	54	55	55	55	55	54	58	59	59	58	56	56	57	60	62	64	68	68	66	64	64	64	60	60	-	59
July.....	64	64	66	65	72	70	74	75	72	72	72	75	75	--	71	72	70	72	74	72	70	65	65	67	69	72	72	70	68	66	68	70
August.....	68	70	70	70	70	66	66	66	66	70	70	70	70	70	70	68	66	65	64	65	64	65	65	66	66	65	63	64	64	65	65	67
September....	67	67	67	65	63	62	62	62	62	61	60	60	64	64	60	59	59	56	56	56	56	58	60	60	60	62	62	61	53	50	-	60
October.....	49	48	47	45	44	48	49	49	54	52	52	51	48	45	47	47	47	48	48	49	49	49	40	46	44	41	41	43	43	42	42	47
November.....	42	42	43	44	44	44	44	44	44	43	43	43	43	43	43	43	43	43	42	41	41	42	43	42	42	42	41	38	36	36	-	42
December.....	34	35	34	33	34	34	34	36	34	34	34	34	34	33	33	32	32	32	32	32	34	34	32	32	32	32	32	32	33	32	32	33

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1955																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	36	32
April.....	39	38	37	30	36	36	36	39	42	44	40	38	41	36	38	39	40	41	41	42	40	42	41	44	45	42	43	44	42	48	-	40
May.....	46	46	46	46	44	49	48	51	50	48	48	50	50	50	44	45	40	50	55	54	56	54	54	50	52	54	52	53	58	53	56	50
June.....	55	54	55	54	54	54	56	57	58	60	62	63	63	66	66	64	62	62	61	61	61	62	72	68	66	68	66	67	65	60	-	61
July.....	58	54	57	58	56	61	59	60	60	64	63	63	68	68	74	74	74	72	71	73	73	73	73	73	72	72	68	66	66	66	67	66
August.....	70	70	71	71	68	68	70	70	68	72	70	71	70	68	68	68	70	70	70	70	68	69	69	66	65	66	64	65	64	64	67	68
September....	67	68	68	68	68	67	65	65	62	58	58	60	62	62	60	60	60	58	58	58	54	51	49	50	50	50	53	54	52	51	-	59
October.....	50	50	50	53	52	52	48	50	50	52	56	55	50	52	52	54	53	52	52	52	50	50	46	46	50	48	48	45	44	44	44	50
November.....	40	38	39	42	44	42	44	40	42	43	40	34	32	32	32	32	33	33	33	39	33	33	32	32	32	32	32	32	32	32	-	36
December.....	33	33	33	34	34	33	32	32	32	32	32	32	32	34	34	34	34	36	34	34	34	33	33	32	32	33	33	34	33	33	33	33
Water temperatures (°F), calendar year 1956																																
January.....	33	33	33	32	33	33	33	33	33	33	34	33	34	33	33	33	33	33	33	32	32	32	32	32	33	33	33	32	32	32	32	33
February.....	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	33	32	32	33	33	33	34	34	34	33	34	34	33	33	-	-	33
March.....	33	33	33	33	33	33	33	33	34	33	33	33	33	33	33	34	34	33	38	39	40	39	39	40	45	44	40	37	40	43	43	36
April.....	49	44	43	43	43	41	42	40	43	43	45	43	45	49	50	50	49	48	49	49	49	49	48	48	46	46	46	46	46	46	-	46
May.....	46	45	46	47	45	46	50	50	50	51	50	50	50	50	51	52	57	60	60	62	62	61	60	62	62	62	62	63	63	63	60	55
June.....	60	68	60	60	62	62	60	66	66	66	66	66	66	68	66	64	66	70	74	72	70	68	68	72	73	72	70	70	72	71	-	67
July.....	70	70	68	69	74	73	75	73	74	74	72	74	70	70	70	70	69	70	74	74	74	74	74	74	72	72	72	70	70	71	70	72
August.....	68	69	68	65	67	67	67	67	68	69	65	64	61	61	62	65	62	61	61	61	61	62	64	65	64	64	61	60	58	56	52	63
September....	55	56	54	54	52	55	55	61	62	62	61	59	58	58	60	59	59	60	58	58	57	53	52	51	51	53	55	52	50	50	-	56
October.....	48	50	50	53	52	51	53	52	52	48	52	52	52	46	44	44	47	48	48	46	46	43	43	42	40	41	40	38	36	34	36	46
November.....	38	38	38	38	36	40	38	38	38	38	38	40	40	36	33	33	33	32	32	33	33	32	32	35	34	33	33	33	33	34	-	35
December.....	33	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Water temperatures (°F), calendar year 1957																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	35	35	35	37	37	37	38	39	38	37	39	39	40	40	38	38	40	43	44	36
April.....	41	41	39	44	46	44	41	42	42	41	43	40	42	41	43	44	44	48	49	48	48	49	50	48	47	47	48	48	55	55	-	45
May.....	54	56	55	55	56	58	57	55	55	54	54	53	57	56	56	55	58	58	60	58	54	50	48	52	56	60	61	61	61	62	62	56
June.....	62	63	61	64	65	64	62	59	61	61	60	59	57	57	58	58	58	59	61	63	62	58	60	60	63	60	60	61	64	64	-	61
July.....	65	65	64	64	65	68	67	67	72	70	70	74	74	73	71	73	70	70	67	69	70	72	71	68	68	69	69	68	69	69	68	69
August.....	68	67	67	68	67	67	67	67	69	69	72	72	69	69	68	68	68	68	66	66	67	67	65	66	64	62	62	62	62	62	62	67
September....	63	63	65	63	65	65	65	64	63	62	61	60	60	60	61	62	60	54	49	49	51	50	56	56	60	60	61	60	61	61	-	60
October.....	59	59	55	50	47	46	45	46	46	46	52	53	54	55	54	52	51	51	50	49	49	46	41	40	40	41	43	46	47	45	47	49
November.....	45	44	44	42	42	43	43	43	42	42	44	42	41	41	41	40	40	38	38	37	37	36	37	36	41	39	38	36	35	35	-	40
December.....	35	34	36	36	36	36	36	36	37	37	36	36	36	36	36	36	37	37	34	34	36	35	34	33	33	33	34	33	33	33	33	35

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1958																																
January.....	33	33	33	33	34	34	34	33	34	34	34	34	34	34	33	35	36	35	34	34	34	33	34	34	35	35	34	34	33	35	35	34
February.....	33	34	34	34	33	34	34	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	40	38	36	36	-	-	-	34
March.....	35	36	35	36	35	36	35	36	36	36	36	36	35	34	34	34	34	34	35	38	40	39	39	39	39	39	41	42	42	44	44	37
April.....	44	43	43	42	41	41	41	43	43	53	46	47	50	51	48	49	50	50	48	46	47	47	42	45	45	45	45	45	47	46	-	46
May.....	49	52	52	54	53	54	54	55	55	56	57	57	53	--	58	58	58	60	60	60	60	63	63	63	63	64	66	64	64	65	63	58
June.....	61	62	62	59	57	60	63	63	60	60	59	56	54	57	56	57	64	62	63	62	62	62	62	66	65	63	64	64	62	62	-	61
July.....	61	64	62	61	61	61	61	61	59	65	66	66	67	65	62	60	67	70	70	71	71	72	68	66	66	65	65	66	66	68	67	65
August.....	70	69	69	67	65	65	69	69	70	70	72	72	72	71	70	70	70	70	69	66	67	67	66	66	66	66	66	66	64	62	60	68
September....	60	61	60	60	60	60	60	63	63	64	65	65	61	58	58	58	58	58	57	55	55	55	55	53	51	52	51	52	51	51	-	58
October.....	56	53	53	55	54	53	53	51	50	42	52	54	55	55	53	54	51	52	51	51	49	47	47	48	46	46	47	46	45	46	45	50
November.....	45	45	45	45	44	44	44	44	43	43	42	42	42	41	39	35	34	34	35	38	38	39	41	40	38	33	33	34	34	34	-	40
December.....	35	36	40	37	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	34	33	33	33	33	33	33	34	34	34	34	34
Water temperatures (°F), calendar year 1959																																
January.....	33	32	32	32	32	32	32	34	33	33	33	33	33	33	33	33	33	34	34	33	36	34	34	34	33	33	33	33	33	33	33	33
February.....	33	33	33	33	33	33	33	33	33	33	33	31	31	31	31	31	31	32	32	32	33	33	33	33	33	33	33	33	-	-	-	32
March.....	33	33	33	33	33	33	33	33	33	33	33	32	33	32	32	33	33	37	40	39	39	41	41	42	42	42	42	42	42	42	42	36
April.....	42	43	43	44	44	45	45	43	42	42	42	45	47	49	48	46	46	46	43	45	45	48	50	46	46	47	47	47	46	47	-	45
May.....	47	51	50	50	48	43	50	46	45	44	44	49	49	51	551	52	51	50	51	48	51	51	51	56	55	55	42	50	49	52	55	50
June.....	58	64	62	61	60	60	60	58	59	55	58	58	63	63	63	63	59	61	61	61	61	62	62	62	62	62	60	58	58	60	-	62
July.....	60	62	62	60	60	61	61	62	63	63	68	72	71	72	70	72	72	72	75	74	74	73	72	74	72	72	72	70	68	63	65	68
August.....	65	65	65	71	69	68	70	70	72	70	70	68	67	65	64	64	67	67	66	62	62	62	60	60	64	62	62	62	64	61	61	65
September....	59	60	62	63	59	58	60	61	57	60	61	61	60	67	64	62	56	54	54	56	56	56	58	58	58	56	54	51	47	47	-	58
October.....	45	42	51	52	52	50	46	45	43	43	43	44	43	50	50	50	50	50	50	48	48	48	48	49	49	49	49	48	47	45	45	47
November.....	45	46	47	42	39	39	42	40	44	42	40	36	34	34	34	33	33	33	33	35	36	36	37	37	38	37	37	35	36	37	-	38
December.....	37	37	38	38	36	36	38	38	36	36	38	37	37	36	36	37	38	36	36	36	36	34	33	34	34	38	37	34	33	32	33	36
Water temperatures (°F), calendar year 1960																																
January.....	33	33	32	32	33	32	33	33	33	33	33	33	33	33	33	32	32	32	32	32	32	32	32	33	33	33	32	32	33	33	33	33
February.....	32	33	33	33	33	33	33	33	33	33	32	32	32	32	32	32	32	33	38	33	33	33	32	32	32	32	32	32	32	-	-	33
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	40	41	43	44	45	49	43	48	47	42	41	36
April.....	40	40	42	44	46	48	45	46	46	47	46	45	43	44	43	43	42	45	44	49	47	44	42	42	40	45	44	42	40	42	-	44
May.....	46	48	48	46	44	43	45	46	46	48	52	54	53	53	49	50	48	47	48	48	50	51	50	51	49	52	54	53	54	56	56	50
June.....	55	56	55	56	56	54	56	58	58	58	61	61	61	61	59	60	60	62	62	61	61	54	54	58	63	63	63	63	63	68	-	59
July.....	67	67	66	68	70	68	70	73	73	70	71	70	69	74	74	74	74	74	74	74	74	74	74	74	70	68	68	70	68	68	68	71
August.....	70	67	65	65	67	69	69	62	63	65	68	68	68	69	67	67	63	63	65	66	66	66	62	58	58	59	59	58	57	57	60	64
September....	63	64	65	65	65	62	59	59	59	59	58	63	63	62	62	62	58	59	57	59	57	55	54	53	54	55	56	56	57	57	-	59
October.....	55	55	56	56	54	56	56	56	55	52	54	49	49	47	47	47	49	50	48	47	48	49	49	50	48	48	47	46	43	43	44	50
November.....	43	43	45	43	43	42	42	41	48	39	40	40	40	40	40	39	39	39	39	38	38	37	36	35	38	38	35	33	33	32	-	39
December.....	35	37	38	36	34	34	32	32	32	32	32	32	35	35	33	32	32	32	32	32	32	33	33	32	32	32	32	32	32	32	32	33

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1961																																
January.....	32	32	32	34	32	32	32	32	32	32	34	34	34	34	34	34	33	34	33	33	32	32	33	32	33	32	32	32	32	32	32	33
February.....	32	33	33	32	32	32	35	36	36	37	38	38	38	35	35	34	33	32	32	33	36	37	37	37	36	36	36	37	-	-	-	35
March.....	37	35	34	34	33	33	34	35	35	37	35	36	36	36	40	45	42	42	44	44	42	40	40	45	45	44	42	43	41	43	43	39
April.....	43	44	46	46	45	44	43	42	42	40	42	44	44	45	45	44	47	47	42	47	46	47	45	45	44	44	44	44	46	48	-	45
May.....	50	52	51	51	50	48	48	46	49	53	52	52	55	55	56	56	51	54	54	54	60	62	65	64	65	63	63	63	67	66	64	56
June.....	61	62	64	67	69	69	69	68	70	70	70	70	66	65	69	70	71	71	75	74	70	70	69	70	70	70	70	70	68	64	-	69
July.....	63	68	67	68	69	69	71	71	73	73	70	68	67	69	69	71	71	72	69	68	68	68	70	69	69	66	68	68	67	68	68	69
August.....	68	70	73	73	73	73	73	73	68	72	69	69	67	70	69	68	70	65	67	69	66	69	67	67	68	68	68	66	66	66	66	69
September....	62	57	55	56	58	52	64	62	61	60	55	54	53	53	50	58	60	62	56	55	52	58	49	48	48	49	47	50	49	49	-	55
October.....	48	48	48	51	55	53	51	49	48	49	49	48	48	50	51	53	52	50	48	48	43	41	38	39	40	42	42	42	40	40	40	47
November.....	42	37	37	35	35	37	39	39	40	42	42	40	38	39	37	36	34	34	34	34	33	33	34	35	35	35	35	36	34	34	-	37
December.....	34	34	34	33	34	33	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	32	32	32	32	32	33
Water temperatures (°F), calendar year 1962																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	33	35	36	35	33	33	35	34	34	33	32	32	32	32	32	32	32	-	-	-	33
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	33	33	32	33	39	38	39	41	42	39	38	38	38	34
April.....	38	40	41	42	43	43	42	42	39	39	40	43	43	47	48	50	50	50	54	53	52	52	54	55	54	53	52	49	45	44	-	47
May.....	47	48	51	51	51	51	53	50	53	55	55	52	52	52	52	50	54	54	58	57	54	53	50	55	54	52	50	51	53	55	57	53
June.....	59	59	60	57	55	54	54	55	59	59	58	58	62	58	55	59	61	62	63	63	62	62	62	63	65	65	66	66	66	67	-	60
July.....	68	66	64	65	65	64	64	70	69	69	70	70	67	59	59	60	67	66	65	65	63	65	67	67	68	68	68	68	66	65	66	66
August.....	67	70	70	70	65	65	65	66	70	69	69	69	70	70	68	68	69	66	65	65	65	65	62	62	62	64	64	62	60	59	59	66
September....	62	60	57	56	59	59	58	55	55	54	56	53	55	55	55	55	57	57	58	59	59	57	57	56	57	53	53	59	58	55	-	57
October.....	55	54	56	55	55	55	55	53	53	50	50	50	53	53	52	50	49	49	50	50	50	50	48	49	50	50	49	50	50	50	50	51
November.....	50	50	49	49	49	49	45	43	45	45	44	44	44	48	42	42	41	39	38	42	40	40	40	37	37	39	42	40	39	37	-	43
December.....	38	38	38	37	35	37	37	37	37	37	35	34	34	37	38	39	41	40	39	38	38	35	33	33	32	32	32	32	32	32	32	36
Water temperatures (°F), calendar year 1963																																
January.....	32	32	32	32	32	32	32	34	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	32	32	32	32	32	35	37	37	37	-	-	-	33
March.....	35	35	35	35	35	34	34	35	35	37	37	35	34	35	35	37	37	38	38	39	41	43	43	45	45	46	42	45	42	42	42	38
April.....	40	38	37	40	42	43	43	42	42	43	47	47	46	46	50	47	43	45	44	44	44	43	45	44	47	49	51	51	49	50	-	45
May.....	51	49	48	46	48	50	53	48	51	50	49	49	49	49	54	56	57	55	55	53	56	55	54	55	56	55	57	56	56	57	58	53
June.....	58	59	59	58	56	58	58	58	58	56	58	58	60	60	64	65	63	63	63	63	62	58	56	58	57	58	60	62	60	55	-	59
July.....	55	61	63	65	65	66	66	69	69	70	65	63	66	68	68	66	64	64	64	66	69	71	70	70	67	68	68	68	68	71	70	67
August.....	68	67	67	68	69	69	72	73	73	73	72	72	73	70	71	70	68	66	67	67	65	64	64	65	65	65	65	63	65	64	63	68
September....	63	63	62	64	65	67	68	68	68	67	66	65	65	60	58	56	55	56	57	59	60	60	60	59	62	60	62	60	62	62	-	62
October.....	60	59	60	59	59	58	57	57	57	57	57	57	57	57	57	57	56	55	55	54	53	52	53	50	50	48	46	46	46	47	46	54
November.....	46	46	45	45	45	45	43	44	44	44	43	43	43	44	46	43	42	39	39	36	34	34	35	35	39	41	40	41	38	37	-	41
December.....	37	37	37	37	43	39	37	35	33	33	32	32	32	32	32	32	32	32	33	32	32	33	33	33	32	33	33	33	32	32	32	34

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1964																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	-	-	32
March.....	32	32	32	33	34	34	33	32	33	33	34	35	34	34	34	35	35	36	36	36	35	33	32	32	32	32	32	32	32	32	40	34
April.....	43	43	40	39	41	42	35	35	42	42	45	42	42	42	42	44	43	42	43	46	44	44	44	41	40	42	42	43	46	50	-	42
May.....	52	50	47	44	41	44	48	48	50	50	50	50	50	53	53	54	55	55	56	54	54	52	50	50	51	52	53	53	51	49	50	51
June.....	52	53	54	56	55	55	55	54	53	51	53	55	56	56	57	57	57	56	56	56	56	56	57	57	60	60	60	60	59	60	-	56
July.....	61	63	62	64	64	64	64	65	66	66	67	68	68	69	68	68	68	70	70	70	71	72	71	69	68	68	70	69	72	69	67	67
August.....	67	65	66	67	70	70	69	69	69	69	67	66	65	65	65	66	67	68	66	61	59	59	62	61	61	60	59	60	58	58	58	64
September....	56	55	55	57	57	55	55	55	55	55	54	53	54	55	58	58	58	57	55	54	55	53	54	55	55	52	52	52	52	52	-	55
October.....	51	50	51	50	50	52	52	53	53	53	52	52	53	53	52	50	48	46	46	47	48	49	48	48	48	48	47	46	47	47	50	50
November.....	50	49	47	45	45	45	44	44	43	43	44	45	41	40	38	37	38	39	40	40	40	40	39	39	38	35	33	33	32	32	-	41
December.....	32	33	33	33	33	35	34	34	34	34	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
Water temperatures (°F), calendar year 1965																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	32	32	35	36	33	32	32	32	32	32	34	36	-	-	-	33
March.....	35	32	32	35	35	35	36	37	36	32	37	36	35	37	36	35	32	32	32	32	34	34	33	32	32	32	32	32	32	32	37	34
April.....	39	40	36	35	37	40	41	44	44	43	41	39	40	43	42	40	40	42	44	45	45	45	45	46	46	45	45	47	50	50	-	43
May.....	49	48	45	47	42	45	44	44	44	48	51	51	54	52	50	50	51	50	49	50	51	50	48	48	48	49	49	51	53	54	54	49
June.....	54	54	56	56	56	57	55	58	56	62	62	62	59	55	55	55	54	55	55	55	57	58	60	61	62	60	57	57	58	60	-	57
July.....	60	62	62	62	63	64	64	65	65	66	65	64	63	63	66	66	67	65	65	67	57	67	66	66	66	68	69	69	70	70	70	65
August.....	73	74	74	74	69	67	68	71	72	72	70	71	69	66	66	66	67	67	66	67	65	65	63	63	62	62	61	63	60	58	56	67
September....	57	63	61	59	56	57	58	57	58	56	55	53	53	53	51	48	46	45	46	48	50	50	48	49	50	49	47	47	48	50	-	52
October.....	51	52	52	53	52	51	51	52	52	52	52	51	52	52	51	51	49	48	49	48	48	48	49	50	50	50	49	49	49	48	48	50
November.....	48	48	48	48	48	47	47	45	45	45	45	44	43	44	45	42	40	40	41	41	41	41	40	39	36	35	35	36	38	37	-	42
December.....	37	37	37	40	40	40	40	39	38	37	37	36	35	35	33	33	33	33	32	33	33	34	34	34	33	33	33	33	32	34	34	35

82. Missouri River above Sun River, at Great Falls, Mont. (6-0783)
Summary of once-daily temperature readings

		Jan		Feb		Mar		Apr		May		June		July		Aug		Sept		Oct		Nov		Dec	
1937	Max	--		--		--		--		--		--		--		--		--		54		51		36	
	Min	--		--		--		--		--		--		--		--		--		48		35		33	
1938	Max	35		35		46		52		58		66		73		70		69		62		50		40	
	Min	33		33		33		34		48		58		64		64		54		46		33		32	
1939	Max	38		34		44		57		66		70		78		74		67		54		47		42	
	Min	32		32		32		42		52		52		64		62		52		41		36		31	
1940	Max	33		34		44		54		66		72		76		74		72		62		48		40	
	Min	32		32		34		40		51		61		70		68		62		46		33		33	
1941	Max	34		42		44		56		64		70		79		74		68		48		38		30	
	Min	32		33		34		44		56		60		65		60		48		38		30		32	
1942	Max	32		32		35		46		62		64		74		--		--		--		44		36	
	Min	32		32		32		35		46		56		66		--		--		--		32		32	
1943	Max	32		32		36		48		60		64		71		70		66		58		44		38	
	Min	32		32		32		36		44		48		62		66		54		46		34		32	
1944	Max	32		32		34		50		66		62		71		70		68		54		51		39	
	Min	32		32		32		34		46		55		62		59		54		48		34		32	
1945	Max	36		32		43		49		56		66		75		73		66		56		45		37	
	Min	32		32		32		36		50		52		60		58		46		42		32		32	
1946	Max	32		34		44		51		62		66		74		73		67		56		42		34	
	Min	32		32		34		36		48		56		64		60		54		38		32		32	
1947	Max	34		34		42		52		68		69		73		73		68		58		48		36	
	Min	32		32		32		36		50		56		62		62		47		48		34		32	
1948	Max	34		32		39		48		60		68		70		72		68		57		47		32	
	Min	32		32		32		36		47		61		64		64		54		46		33		32	
1949	Max	32		32		36		52		63		70		74		76		69		60		46		37	
	Min	32		32		32		38		48		57		64		68		50		--		38		32	
1950	Max	32		33		39		46		57		71		72		72		70		54		46		36	
	Min	32		32		32		38		41		50		66		62		48		46		32		32	
1951	Max	33		34		35		48		60		--		73		73		62		60		42		38	
	Min	32		32		32		33		45		--		60		60		49		40		32		30	
1952	Max	32		38		40		57		60		64		72		72		64		58		46		40	
	Min	32		32		32		38		48		48		62		58		56		46		32		32	
1953	Max	34		36		40		52		58		63		72		72		67		56		48		40	
	Min	32		32		32		38		44		50		64		60		55		46		38		32	
1954	Max	36		38		40		53		62		68		75		70		67		54		44		36	
	Min	32		32		32		32		40		52		64		63		50		40		36		32	
1955	Max	32		32		36		48		58		72		74		71		68		56		44		36	
	Min	32		32		32		30		40		54		54		64		49		44		32		32	
1956	Max	34		34		45		50		63		74		75		69		62		53		40		33	
	Min	32		32		33		40		45		60		68		52		50		34		32		32	
1957	Max	32		32		44		55		62		65		74		72		65		59		45		37	
	Min	32		32		32		39		48		57		64		62		49		40		35		33	
1958	Max	36		40		44		53		66		66		72		72		65		56		45		40	
	Min	33		33		34		41		49		54		59		60		51		42		33		32	
1959	Max	36		33		42		50		56		64		75		72		67		52		46		38	
	Min	32		31		32		42		43		55		60		60		47		42		33		32	
1960	Max	33		38		49		49		56		68		74		70		65		56		48		38	
	Min	32		32		32		40		43		54		66		57		53		43		32		32	
1961	Max	34		38		45		48		67		75		73		73		64		55		42		34	
	Min	32		32		33		40		46		61		63		65		47		38		33		32	
1962	Max	33		36		42		55		58		67		70		70		62		56		50		41	
	Min	32		32		32		38		47		54		59		59		53		48		37		32	
1963	Max	34		37		46		51		58		65		71		73		68		60		46		43	
	Min	32		32		34		37		46		55		55		63		55		46		34		32	
1964	Max	32		33		40		50		56		60		72		70		58		53		50		35	
	Min	32		32		32		35		41		51		61		58		52		46		32		32	
1965	Max	32		36		37		50		54		62		70		74		63		53		48		40	
	Min	32		32		32		35		42		54		57		56		45		48		35		32	
Extremes for years, 1937-65																									
	Max	38		42		49		57		68		75		79		76		72		62		51		42	
	Min	32		31		32		30		40		48		54		52		45		34		30		30	

83. North Fork Sun River near Augusta, Mont. (6-0785)

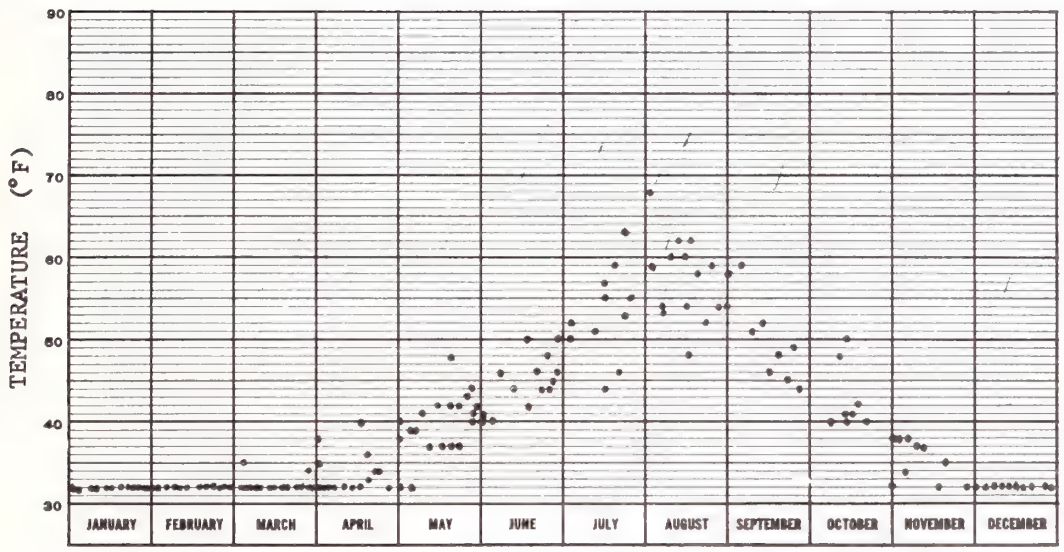
Location.--At gaging station, lat 47°38'30", long 112°51'30", in SW¼SW¼ sec.23, T.22 N., R.10 W., on left bank 400 ft upstream from Arsenic Creek, 1 mile upstream from confluence with South Fork, and 25 miles northwest of Augusta. Datum of gage is 4,785.72 ft above mean sea level (levels by Bureau of Reclamation).

Drainage area.--258 sq mi.

Water temperature records available.--164 spot observations at time of discharge measurements made during period March 1949 to December 1965.

Extremes.--Discharge 1911-12, 1945-65: Maximum, 51,100 cfs June 8, 1964; minimum, 27 cfs Nov. 21, 1949.

Water temperatures 1949-65: Maximum observed, 68°F Aug. 2, 1949; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

83. North Fork Sun River near Augusta, Mont. (6-0785)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
18-51	1830	32	28-51	1530	32	2-49	1500	35	1-49	1100	35	3-49	0930	39	29-49	1000	46
1-54	1400	32	5-52	1620	32	30-51	1800	34	25-51	1220	40	22-51	1200	42	21-51	1510	44
27-55	1245	32	27-52	1830	32	4-54	1600	32	1-52	1400	32	3-54	1200	32	27-52	1700	48
4-56	1330	32	1-54	1730	32	2-55	1800	32	22-53	1400	32	28-55	1100	41	2-53	1700	40
3-57	1500	32	5-56	1700	32	4-56	1230	32	7-54	1500	32	1-56	1300	32	30-53	1200	50
3-58	1700	32	6-57	1200	32	6-57	1520	32	2-55	1100	32	3-57	1305	39	18-55	1200	42
1-59	1440	32	1-58	1520	32	3-58	1400	32	4-56	1400	32	26-57	1310	44	18-56	1600	50
1-60	1620	32	3-59	1800	32	2-59	1600	32	1-57	1700	32	1-58	0930	40	19-58	1430	46
31-60	1110	32	27-61	1730	32	6-60	1200	32	1-58	1100	32	21-58	1500	48	9-59	1730	44
31-61	1500	32	25-63	1600	32	30-60	1500	32	1-59	1540	38	1-59	1515	38	1-60	1430	40
28-62	1600	32	26-64	1800	32	29-61	1600	32	29-60	1000	32	21-59	1730	37	6-63	1705	46
31-63	1500	32	24-65	1500	32	6-62	1300	32	28-61	1200	34	22-59	1030	37	1-64	1500	41
24-64	1730	32				30-62	1400	32	28-62	1600	34	16-61	1500	42	28-64	1800	45
6-65	1400	32				25-63	1200	32	25-63	1100	32	25-61	1330	43	27-65	1300	44
29-65	1730	32				25-64	1700	32	26-64	1530	33	29-62	1030	42			
						29-65	1500	32	26-65	1600	36	28-63	0950	40			
												21-64	1830	42			
												11-65	1200	41			
												12-65	0630	37			
												20-65	0915	37			
July			August			September			October			November			December		
13-51	1745	44	2-49	1730	68	11-50	1400	51	14-50	1700	50	8-51	1345	37	10-51	1630	32
11-55	1830	51	4-50	1640	54	14-51	1320	46	11-51	1145	40	20-52	1400	35	9-53	1400	32
23-56	1700	63	17-51	1015	48	12-52	1425	52	16-52	1355	41	9-53	1700	37	2-54	1500	32
2-57	1230	52	4-52	0905	53	25-56	1345	49	9-55	1610	48	3-58	1200	34	29-54	1100	32
25-58	1330	55	30-55	1225	54	19-58	1600	48	8-57	1500	40	1-59	1600	38	6-55	1400	32
23-59	1200	53	20-56	1330	54	27-59	1400	44	23-58	1430	40	2-59	1200	38	13-56	1330	32
13-60	1130	55	6-57	1400	60	21-60	1100	45	11-61	1230	41	1-61	1300	32	3-57	1500	32
13-61	1330	57	27-57	1600	52	1-62	1625	58	17-62	1400	42	30-61	1530	32	2-58	1125	32
20-62	1300	46	22-58	1300	62	5-63	1400	59				1-62	1500	38	1-59	1300	32
2-63	1045	50	24-59	1430	58							19-63	1600	32	2-60	1500	32
17-64	2000	59	21-60	1500	60							3-65	1530	38	30-60	1600	32
			29-61	1330	59										30-61	1600	32
			7-63	1530	62										1-62	1600	32
			2-65	1600	59										30-62	1600	32
			31-65	1500	54										24-63	1130	32
															2-65	1630	32
															30-65	1700	32

84. Muddy Creek at Vaughn, Mont. (6-0885)

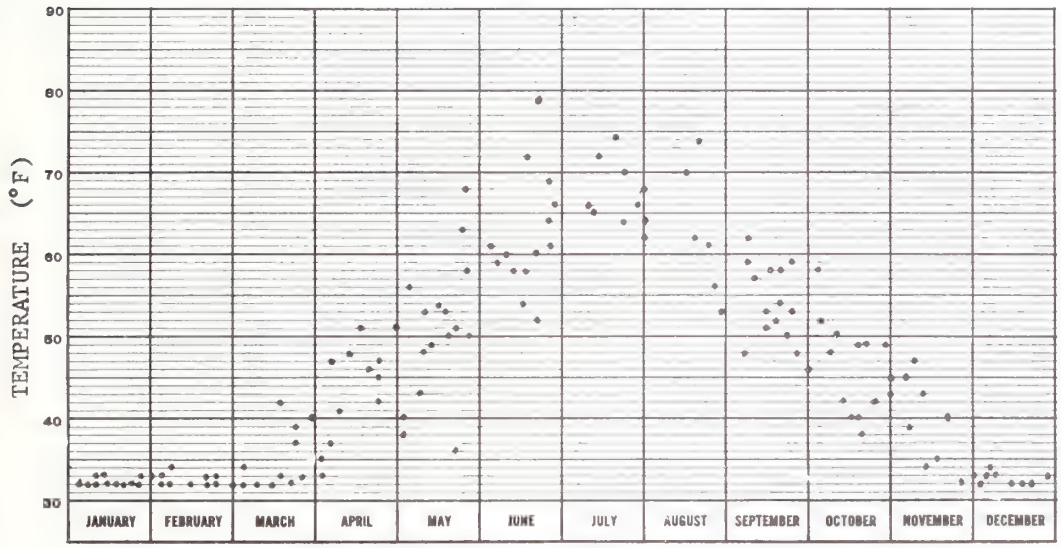
Location.--At gaging station, lat 47°33'40", long 111°32'30", near center of S½NE¼ sec.24, T.21 N., R.1 E., near center of span on upstream side of old highway bridge at Vaughn, 1½ miles upstream from mouth. Altitude of gage is 3,350 ft (from topographic map).

Drainage area.--314 sq mi.

Water temperature records available.--142 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1925-26, 1934-65: Maximum, 7,600 cfs June 4, 1953; minimum observed, 4.9 cfs Jan. 24, 1936. Flood in June 1908 reached a stage of about 24 ft, present datum; flood in June 1932 reached a stage of about 19 ft, present datum; discharges not determined.

Water temperatures 1949-65: Maximum observed, 79°F June 20, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures 1949-65

84. Muddy Creek at Vaughn, Mont. (6-0885)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-51	1645	32	5-51	1710	32	27-51	1045	32	20-49	1130	51	9-49	1600	54	10-52	1530	58
22-52	1330	32	27-51	1715	32	18-52	1430	32	5-51	1735	47	3-51	1525	56	8-55	1155	60
21-53	1230	32	19-52	1730	32	31-53	0800	40	4-52	1900	37	6-52	0900	53	14-55	1515	72
11-54	1330	32	25-53	1030	32	1-55	1300	32	15-52	0930	48	10-56	1500	53	26-56	1700	64
3-55	1730	32	3-55	1230	32	27-56	1630	32	26-55	0900	42	8-57	0900	49	5-57	1800	59
9-60	1700	32	5-60	1700	32	28-57	1700	39	22-58	1330	46	13-58	1130	51	12-58	1600	54
5-61	1500	32	1-61	1440	33	25-59	1430	42	30-59	1800	51	28-61	0830	68	18-59	1630	60
8-63	1235	32	27-61	1600	33	8-60	1900	32	26-60	1330	47	11-62	1230	50	3-60	1200	61
27-64	1210	33	5-62	1620	32	28-61	1000	37	26-61	1730	45	29-62	1000	58	20-61	1840	79
5-65	1330	33	6-63	1300	34	29-62	1200	33	2-63	0950	35	2-63	1230	40	27-62	1130	66
7-65	1445	33	25-64	1720	33	3-63	1755	32	8-64	1445	41	22-63	1920	63	26-63	1445	61
			3-65	1100	33	26-64	1705	33	2-65	1000	33	4-64	1200	43	12-64	1930	58
						3-65	1515	34				6-64	1045	48	26-64	0930	69
												29-64	1050	50	18-65	1430	52
												2-65	0830	38			
												19-65	1600	36			
July			August			September			October			November			December		
15-52	1000	65	21-52	1000	62	27-49	1130	59	18-50	1340	49	13-51	0900	34	5-50	1045	32
20-55	1830	74	23-55	1600	74	7-50	0950	59	15-51	1600	40	18-52	0800	35	19-51	1200	32
24-56	1330	70	20-58	1800	70	18-51	1830	58	16-51	1530	38	12-53	1700	43	16-52	1530	32
25-57	1200	64	27-60	1405	56	23-52	0930	54	14-52	0900	40	29-54	1700	32	11-53	1100	32
17-59	1600	72	1-61	1300	68	8-53	1600	57	16-57	1400	49	26-57	1400	40	2-59	1530	32
14-60	1020	66	1-62	0830	64	28-53	1730	53	13-58	1530	42	1-59	1700	45	1-60	1310	33
30-64	1925	66	1-63	1005	62	20-56	1600	52	9-61	1500	50	1-60	1350	43	3-62	1330	33
			25-64	1100	61	25-57	1500	58	30-61	1700	49	5-62	1430	47	5-63	0815	33
			30-65	0900	53	17-58	1300	51	8-62	1815	48	15-63	0900	39	30-63	1730	33
						26-59	1230	50	4-63	1130	58	4-65	1635	45	5-64	1200	33
						29-60	0800	48	6-64	1500	52				4-65	0920	34
						13-61	1800	53	27-64	1400	43						
						7-62	1830	48	1-65	1530	46						
						7-63	0750	62									

85. Sun River near Vaughn, Mont. (6-0890)

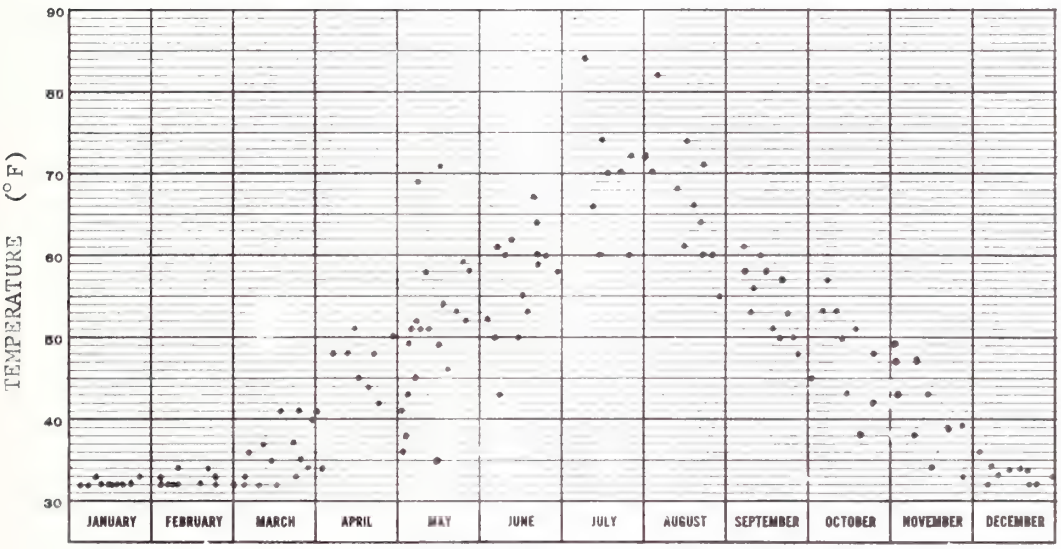
Location.--At gaging station, lat 47°31'35", long 111°29'05", in SE¼SW¼ sec.33, T.21 N., R.2 E., on right bank 4 miles downstream from Muddy Creek, 4 miles southeast of Vaughn, and 13 miles upstream from mouth. Datum of gage is 3,317.12 ft above mean sea level, datum of 1929, supplementary adjustment of 1962.

Drainage area.--1,854 sq mi.

Water temperature records available.--145 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1934-65: Maximum, 53,500 cfs June 9, 1964 (42,200 cfs in main channel, plus 11,300 cfs in bypass channel); minimum, 20 cfs Apr. 24, 1944.

Water temperatures 1949-65: Maximum observed, 84°F July 14, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

85. Sun River near Vaughn, Mont. (6-0890)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-51	1130	32	6-51	1210	32	20-52	1130	32	20-49	1000	51	11-49	1530	69	10-52	1730	60
23-52	--	32	27-51	1140	32	3-53	--	32	6-51	1345	48	3-51	1100	38	12-53	2040	62
21-53	1230	32	20-52	1630	32	31-53	0930	40	15-52	1200	48	6-52	1100	51	9-54	1400	43
11-54	1600	32	4-54	1500	32	1-55	1130	32	28-53	1700	48	25-53	1700	46	14-55	1330	50
4-55	1130	32	3-55	1100	32	27-56	1500	37	26-55	1030	44	27-53	1700	53	26-56	1530	60
8-58	1000	32	5-60	1130	32	28-57	1530	41	22-58	1500	45	19-54	2000	49	16-58	1300	55
9-60	1130	32	27-61	1425	33	13-58	1600	35	30-59	1730	50	10-56	1630	51	21-61	0815	67
8-63	1400	32	6-63	1415	34	25-59	1530	41	27-61	0825	42	24-56	1700	54	5-62	1200	50
27-64	0740	33	26-64	0900	34	9-60	1130	32	1-63	1710	51	8-57	1030	45	27-62	1330	60
7-65	1305	33	3-65	1435	33	28-61	0900	35	2-65	0850	34	13-58	1230	51	6-63	1700	61
						29-62	1330	34				5-60	1200	43	26-63	1530	64
						4-63	1250	36				15-61	1615	58	3-64	0920	52
						27-64	1410	33				28-61	1135	59	26-64	1155	59
						3-65	1740	33				29-61	0930	58	30-64	1035	58
						10-65	0845	37				11-62	1000	52	18-65	1250	53
												28-62	1905	52			
												2-63	1600	41			
												22-63	1700	71			
												6-64	0900	49			
												2-65	1155	36			
												19-65	1440	35			
July			August			September			October			November			December		
15-52	1200	66	4-49	1230	82	7-50	0800	61	18-51	1700	38	15-51	1330	34	20-51	1100	32
23-54	1000	60	2-50	1730	70	20-51	1600	50	14-52	1130	43	12-53	1600	43	17-52	1630	32
21-55	1335	70	16-51	1530	68	8-53	1730	56	7-55	1350	53	29-54	1530	33	9-58	1600	34
25-56	1800	72	21-52	1330	66	28-53	1600	50	25-56	1700	42	29-56	1300	39	2-59	1700	36
16-58	1230	60	23-55	1345	71	15-54	1010	58	16-57	1300	51	26-57	1300	39	12-60	1310	34
17-59	1100	73	22-56	0830	64	20-56	1500	50	14-58	1500	43	1-59	1500	47	3-62	1420	32
14-60	1300	84	20-58	1430	74	25-57	1330	57	8-62	1545	50	1-60	1605	43	5-63	0920	33
18-62	1400	70	19-59	1300	61	17-58	1400	51	4-63	0930	53	5-62	1430	47	31-63	1230	33
			26-60	1020	60	26-59	1000	53	6-64	1335	57	5-63	1100	38	5-64	1430	33
			1-61	1130	72	29-60	1015	48	1-65	1500	45	1-64	1230	49	3-65	1215	34
			25-64	1325	60	14-61	1230	60	25-65	1620	48						
			30-65	1315	55	8-62	1715	53									
						7-63	1000	58									

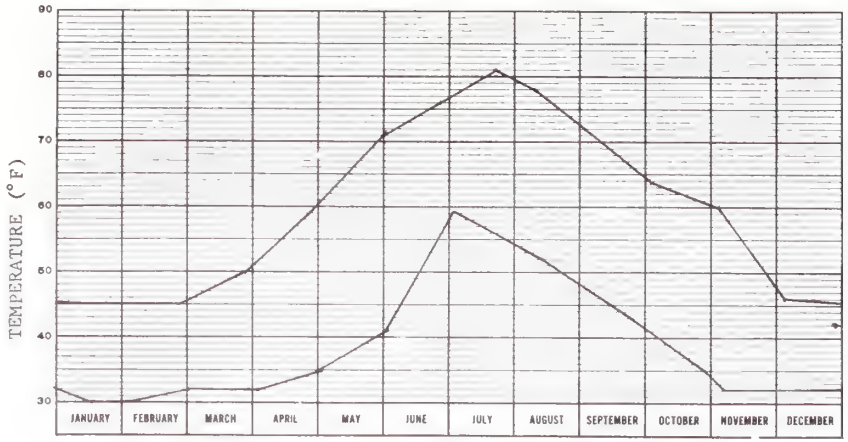
86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Location.--Lat 47°34'15", long 111°07'20", in SE¼SW¼ sec.17, T.21 N., R.5 E., at penstock in Ryan Dam, 8 miles northeast of Black Eagle. Altitude is about 3,020 ft.

Water temperature records available.--Once-daily temperature readings taken at 0700 hours February 1917 to November 1928 (incomplete) and January 1930 to February 1964 (incomplete) published in this report.

Extremes.--Water temperatures 1917-28, 1930-64: Maximum observed, 81°F July 23, 1936; minimum, freezing point on many days during winter months.

Cooperation.--Records furnished by The Montana Power Co.



Lines delineate the range between the highest and lowest temperatures from once-daily observations, 1917-28, 1930-64.

Water temperatures (°F), calendar year 1917

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January.....																																
February.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	34	33	32	33	33	32	32	32	32	32	32	32	--	-	-	-	--
March.....	32	32	--	32	32	32	--	--	32	32	32	32	32	32	32	32	32	32	32	--	32	32	32	32	32	33	33	33	33	33	32	32
April.....	32	32	32	--	33	33	33	33	--	--	--	--	--	39	41	37	37	37	42	--	44	--	--	--	--	--	36	--	35	35	-	36
May.....	35	36	36	36	36	36	48	50	50	48	54	54	54	--	54	54	50	50	50	54	52	50	50	52	52	50	50	50	50	46	45	48
June.....	46	52	52	50	50	50	52	52	52	52	50	50	52	53	54	54	54	59	60	59	59	61	61	61	62	62	62	63	63	63	--	56
July.....	61	63	65	65	63	64	64	65	66	68	68	68	68	68	68	--	--	--	70	--	71	70	71	--	72	--	73	74	72	67	66	68
August.....	67	65	67	67	65	67	65	62	62	64	63	65	67	68	68	69	70	69	69	69	68	67	67	68	68	62	62	64	64	64	63	66
September....	--	--	--	--	--	--	--	--	--	--	--	61	59	59	57	58	58	59	58	--	62	63	63	61	55	54	53	53	55	55	--	--
October.....	57	55	55	55	55	55	55	54	52	52	51	50	52	53	53	53	50	45	44	43	43	41	42	43	43	43	43	39	36	36	36	48
November.....	39	41	45	45	45	45	45	43	43	43	41	41	41	39	39	36	37	36	36	41	43	45	45	45	43	43	39	40	40	37	-	41
December.....	37	37	36	35	34	34	33	33	32	32	32	32	32	32	33	34	35	35	35	35	35	35	35	--	32	32	32	32	32	35	33	34

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1918																																
January.....	33	33	34	33	33	34	34	33	33	33	33	33	33	33	34	34	33	34	34	34	34	33	34	34	34	33	33	32	32	32	32	33
February.....	32	33	34	34	34	34	34	34	34	35	35	34	34	33	33	32	32	32	32	32	32	33	33	33	33	33	33	33	-	-	-	33
March.....	34	34	34	34	33	32	32	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	36	36	37	39	37	37	--	--	43	35
April.....	43	43	37	36	36	38	39	41	43	46	46	48	44	44	44	44	43	42	48	48	49	46	39	39	39	39	39	39	39	39	-	42
May.....	50	50	53	53	53	53	50	48	46	43	46	46	48	54	53	52	50	50	50	50	50	52	53	54	52	50	49	50	52	54	57	51
June.....	55	52	52	52	55	57	57	59	61	59	59	59	61	61	63	63	61	64	66	66	64	66	68	68	68	66	64	61	61	61	-	61
July.....	64	66	64	64	64	66	66	67	69	66	68	70	69	69	69	68	66	67	68	68	68	69	70	70	64	65	65	61	65	67	69	67
August.....	61	61	66	70	69	68	69	69	66	66	66	64	66	64	65	65	67	68	66	65	66	64	63	64	64	68	68	68	64	64	64	66
September....	64	64	60	60	60	60	60	64	56	56	56	61	61	61	57	62	61	57	60	58	60	61	61	59	59	57	57	59	60	58	-	60
October.....	57	57	57	57	59	57	57	53	53	55	53	53	53	57	57	57	55	53	53	51	53	50	50	50	49	48	48	48	48	48	48	53
November.....	48	48	47	48	46	43	43	44	43	43	43	43	43	43	43	43	43	43	41	41	39	39	37	35	35	35	35	35	35	35	-	41
December.....	37	37	37	39	39	39	39	38	38	37	37	37	35	35	35	35	35	35	34	34	34	34	34	34	35	34	34	34	34	34	32	36
Water temperatures (°F), calendar year 1919																																
January.....	34	34	34	34	34	34	35	35	35	35	35	35	34	34	35	35	35	36	36	35	35	35	35	36	34	35	34	34	34	34	35	35
February.....	34	34	34	34	34	32	32	34	33	33	33	33	34	34	34	34	34	34	34	34	34	34	33	32	32	32	32	32	-	-	-	33
March.....	32	32	33	33	33	33	33	33	35	32	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	35	36	37	41	42	34
April.....	42	42	42	44	46	42	41	41	41	42	42	42	43	43	43	43	44	45	46	47	50	50	49	52	53	53	53	55	53	54	-	46
May.....	53	50	49	49	49	49	49	49	49	53	53	53	55	53	53	53	53	53	57	57	57	62	62	60	63	65	63	64	63	62	60	55
June.....	58	55	55	59	59	64	62	63	64	62	62	60	58	60	64	66	66	66	70	71	71	71	--	70	73	73	73	72	71	70	-	65
July.....	69	68	69	68	69	72	71	70	70	71	71	71	70	69	71	71	75	68	68	68	68	68	68	68	71	71	69	69	70	68	70	70
August.....	70	70	--	68	68	66	66	68	68	68	68	67	69	70	66	64	64	66	66	68	68	66	64	64	64	65	65	65	65	65	65	67
September....	65	65	63	62	65	60	60	61	59	60	60	61	60	59	57	59	60	60	60	60	59	55	55	56	57	57	53	48	46	48	-	58
October.....	50	50	50	50	50	54	44	44	50	46	45	45	46	46	46	46	46	46	46	46	46	46	42	39	37	37	35	35	35	36	36	44
November.....	36	35	37	35	37	35	35	35	35	35	33	33	35	35	35	37	35	35	35	36	37	37	38	38	38	35	34	35	34	34	-	35
December.....	34	34	34	34	34	34	34	34	33	33	33	33	33	33	34	35	35	37	35	35	37	35	35	34	34	35	35	37	36	37	34	35
Water temperatures (°F), calendar year 1920																																
January.....	35	35	35	35	35	35	35	35	37	35	34	35	35	35	35	35	35	35	36	34	34	34	34	34	34	33	33	34	34	34	34	35
February.....	35	35	34	35	34	35	35	35	37	37	36	36	36	36	36	37	36	36	36	36	36	36	36	34	34	34	34	34	34	-	-	35
March.....	35	34	34	34	34	33	34	33	33	34	34	34	35	35	33	33	33	34	34	34	34	39	39	39	40	40	40	39	40	40	42	36
April.....	39	37	39	39	37	36	39	41	43	43	41	43	45	44	46	42	43	43	42	46	46	44	43	36	--	36	44	46	44	42	-	42
May.....	42	43	43	46	46	49	50	50	50	52	50	47	46	50	50	52	52	50	50	50	51	52	52	54	52	51	52	52	54	53	53	50
June.....	--	53	53	53	55	57	57	57	57	59	57	57	57	57	57	58	58	58	57	59	57	61	61	61	61	61	61	62	64	66	-	58
July.....	67	68	68	68	66	66	65	62	66	65	68	68	68	64	66	68	71	71	71	71	--	73	71	71	72	72	72	75	72	70	74	69
August.....	72	73	75	72	71	75	72	62	70	67	68	66	68	69	71	71	71	68	65	66	65	68	68	70	68	68	68	68	65	63	61	69
September....	59	59	60	62	66	66	65	66	66	64	57	60	59	57	59	57	57	59	60	63	63	61	59	57	54	54	52	52	54	54	-	59
October.....	56	53	52	50	51	51	51	51	51	51	51	51	50	49	48	46	47	41	41	41	41	42	40	41	41	42	41	43	43	41	40	46
November.....	43	41	41	41	41	39	39	39	39	40	35	34	34	34	35	35	38	37	38	38	38	38	37	36	37	37	37	37	36	36	-	38
December.....	36	38	36	37	36	36	37	35	34	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	36	36	36	36	35

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1921																																
January	34	35	37	36	36	36	34	34	35	34	34	34	34	34	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
February	34	34	34	34	34	34	35	35	36	36	36	37	37	37	36	34	34	33	33	33	34	34	35	35	36	36	37	38	-	-	-	35
March	39	39	40	41	40	40	36	36	36	36	34	34	--	32	33	33	33	34	35	35	38	37	37	41	38	37	38	39	40	40	41	37
April	42	45	46	46	43	43	40	40	41	42	44	46	47	49	47	47	47	46	48	48	48	47	48	46	46	46	46	47	49	48	-	46
May	46	47	48	48	48	51	52	53	51	48	50	50	50	49	48	49	49	50	53	53	53	55	55	56	57	57	57	58	52	52	55	52
June	55	54	55	57	59	59	59	59	59	59	59	59	60	62	63	60	60	60	64	67	64	65	65	67	66	66	68	68	70	69	-	62
July	68	67	62	62	64	64	67	69	61	61	71	71	70	70	71	71	71	71	71	71	72	71	72	71	71	71	71	71	69	69	68	69
August	--	--	--	--	--	--	--	--	--	--	--	68	68	--	--	67	66	66	66	--	--	--	66	67	67	67	--	--	--	--	--	--
September	--	64	64	64	59	57	52	59	57	56	50	50	48	49	50	50	51	52	59	59	60	60	60	60	60	60	60	57	55	53	-	56
October	52	52	52	53	53	53	52	52	53	53	53	53	53	53	53	53	51	51	51	52	52	51	50	50	50	47	47	47	47	48	50	51
November	48	59	49	60	60	59	58	44	42	42	42	42	44	42	41	41	39	37	34	34	34	32	34	34	34	35	35	36	36	37	-	42
December	37	38	37	37	37	37	36	36	36	36	36	39	43	43	39	35	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	35
Water temperatures (°F), calendar year 1922																																
January	32	33	32	32	32	32	32	33	37	37	36	36	37	36	36	36	34	34	34	34	34	33	32	32	32	35	35	33	32	32	32	35
February	32	32	32	34	34	35	35	35	34	34	33	33	33	33	33	34	35	35	35	33	33	33	33	33	33	33	33	33	-	-	-	34
March	33	34	34	34	34	32	33	34	33	34	34	34	34	34	34	34	34	34	34	35	35	35	35	34	34	34	34	34	34	34	35	34
April	35	41	41	43	43	40	41	41	41	41	41	40	41	41	42	41	39	39	40	42	43	44	46	--	46	44	42	45	44	46	-	42
May	45	46	44	46	48	48	50	50	50	48	49	49	50	50	49	50	52	55	55	56	55	56	54	55	50	57	55	51	50	53	55	51
June	57	58	59	60	60	59	57	56	55	55	57	59	60	64	62	62	60	62	63	62	64	66	66	64	64	68	68	68	70	72	-	62
July	70	72	70	72	72	68	68	68	63	61	63	64	68	70	70	70	70	70	72	72	70	70	68	68	70	70	70	71	70	72	72	69
August	75	73	75	73	72	72	72	72	72	72	72	72	72	70	70	70	70	68	70	70	68	68	70	68	68	68	70	68	68	70	69	71
September	68	65	66	66	65	67	63	63	56	53	63	63	63	66	64	62	64	64	64	64	64	64	61	61	61	63	64	63	57	56	-	63
October	57	57	57	59	57	57	57	57	57	57	56	55	56	55	50	49	49	49	49	49	50	50	50	50	50	50	50	50	50	48	48	53
November	46	44	43	43	43	41	43	41	41	41	41	41	40	40	40	41	41	41	40	40	40	42	40	41	40	41	41	42	41	38	-	41
December	36	35	34	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	34	33	33	33	34	34	33	33	33
Water temperatures (°F), calendar year 1923																																
January	33	33	34	33	34	34	33	34	33	33	33	32	32	32	32	32	32	32	32	32	32	32	35	32	33	33	33	33	33	32	32	33
February	33	33	33	33	33	33	33	33	33	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	-	-	-	32
March	32	32	32	32	32	32	34	34	34	34	34	34	34	34	33	34	33	33	34	33	32	33	32	34	33	34	34	35	35	35	35	33
April	36	34	34	34	34	34	33	34	38	38	45	46	45	45	45	37	38	38	38	46	46	44	43	43	43	44	46	46	48	50	-	41
May	50	48	46	50	51	52	51	51	52	52	51	50	52	52	48	50	51	52	50	51	53	53	53	53	54	54	58	55	55	57	57	52
June	57	57	57	61	55	60	60	61	61	63	64	63	63	59	61	61	63	61	61	61	61	59	61	61	61	61	63	63	64	63	-	61
July	63	64	66	66	66	67	66	66	68	72	70	70	73	73	75	75	73	72	72	72	74	76	72	73	73	73	72	75	72	70	72	71
August	66	66	66	61	66	67	69	68	68	68	69	70	70	70	70	70	70	70	70	72	66	66	66	66	68	68	68	68	68	68	69	68
September	70	70	70	68	68	68	68	68	68	66	64	64	63	68	64	64	61	61	59	59	61	59	57	57	57	57	57	57	57	57	-	63
October	54	56	55	55	55	55	56	56	53	53	53	50	50	51	52	50	50	48	38	39	50	48	50	48	47	45	45	43	42	39	39	49
November	41	41	43	43	43	43	42	32	42	43	43	43	43	43	43	43	44	44	43	43	41	40	40	40	41	41	39	39	39	39	-	41
December	--	36	35	34	36	36	37	36	35	33	36	34	33	35	36	36	36	36	36	35	35	36	36	36	36	36	35	36	35	34	34	35

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1924																																
January.....	34	34	34	34	34	36	33	33	33	33	33	32	33	33	33	33	33	33	33	33	35	36	35	34	33	35	35	36	36	36	36	34
February.....	36	36	36	36	39	36	36	37	36	36	36	37	37	36	36	36	37	33	33	33	33	33	33	33	33	33	34	37	38	-	-	35
March.....	39	38	39	39	39	39	39	38	38	39	39	39	39	40	39	38	38	38	37	37	37	37	39	39	39	39	39	39	39	39	38	39
April.....	40	43	43	43	43	--	--	46	43	45	45	45	43	43	43	41	41	42	43	42	42	43	43	46	44	45	46	47	47	47	-	44
May.....	50	56	55	55	53	48	52	58	52	54	54	54	54	54	54	56	57	54	53	50	50	53	53	53	54	53	54	54	54	54	54	54
June.....	55	59	61	61	57	59	55	56	51	52	57	61	61	63	64	67	67	66	63	60	61	61	63	63	61	63	64	64	64	66	-	61
July.....																																
August.....																																
September....																																
October.....																																
November.....																																
December.....																																
Water temperatures (°F), calendar year 1925																																
January.....	34	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	36	36	33	33	33	33	33	33	33	33	35	35	35	36	36	35
February.....																																--
March.....																																--
April.....	46	44	46	46	46	44	45	46	47	50	51	53	50	50	49	49	50	49	49	50	50	50	49	48	47	48	48	49	48	51	-	48
May.....	52	52	52	50	50	50	53	51	50	47	50	53	57	57	56	53	51	53	53	54	54	53	52	54	54	56	57	61	61	60	61	54
June.....	61	54	58	59	57	53	57	59	60	60	57	57	57	57	57	57	58	60	63	66	66	64	64	64	64	68	68	68	68	70	-	61
July.....	70	70	70	70	70	70	70	66	66	68	70	70	68	70	73	73	75	73	72	71	70	69	68	68	68	70	71	72	72	72	72	70
August.....	72	73	75	72	72	72	72	72	70	72	72	68	70	70	64	57	57	61	64	69	70	70	68	66	64	64	65	64	63	63	64	68
September....	64	64	64	68	68	64	62	64	63	61	59	61	61	63	64	64	61	61	59	52	54	54	57	59	61	69	55	52	50	55	-	60
October.....	50	52	52	52	50	48	46	45	47	48	50	48	48	46	46	46	46	43	43	46	46	48	48	46	44	43	39	36	36	36	39	46
November.....	39	41	41	39	39	39	39	39	39	41	41	39	39	39	39	40	40	40	40	40	39	39	38	39	39	38	37	37	36	36	-	39
December.....	39	39	39	38	38	39	39	39	39	39	39	39	39	39	37	37	39	39	39	37	35	35	35	35	35	38	34	34	34	34	34	37
Water temperatures (°F), calendar year 1926																																
January.....																																--
February.....	36	36	36	36	36	36	36	38	38	39	39	39	38	38	35	35	35	35	37	39	39	39	39	37	38	38	39	40	-	-	-	37
March.....																																--
April.....																																--
May.....																																--
June.....	59	61	63	66	65	66	68	68	68	68	68	64	63	61	59	59	59	61	64	63	59	59	60	63	66	69	71	71	72	71	-	64
July.....																																--
August.....																																--
September....	60	64	60	60	60	64	62	60	60	60	60	58	54	54	54	53	53	68	51	51	53	51	50	46	44	46	50	50	50	53		55
October.....	51	53	53	48	53	53	52	53	50	50	50	50	50	50	52	52	53	53	52	50	50	50	50	50	50	50	50	50	48	48	48	51
November.....	48	48	48	48	48	48	48	46	46	46	46	48	46	46	44	42	41	39	37	35	35	36	36	38	38	36	36	36	36	38	-	42
December.....																																--

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1927																																
January	35	32	36	36	36	36	36	36	36	35	35	35	32	34	36	36	32	32	33	32	32	32	33	33	33	33	33	33	33	33	35	34
February	35	35	35	35	35	35	35	34	34	34	35	35	35	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	-	-	-	33
March	33	33	33	33	33	34	34	34	34	34	34	34	35	43	41	39	40	37	37	39	39	41	41	41	39	41	39	42	35	42	42	36
April	42	42	42	42	42	42	45	45	45	41	41	40	41	42	44	46	44	44	43	40	41	42	46	48	51	53	50	53	53	50	-	45
May	50	48	46	46	46	46	46	44	45	46	50	53	53	53	55	55	55	53	50	46	48	46	45	48	50	50	52	50	50	48	47	49
June	50	52	52	52	52	55	57	54	57	55	55	55	55	57	60	60	60	62	60	60	61	62	64	64	63	64	66	66	66	66	-	59
July	66	66	66	66	66	62	64	68	70	68	68	66	66	66	64	64	66	66	69	70	70	70	70	70	70	70	70	70	69	69	69	68
August	68	68	68	68	68	68	69	69	69	69	70	70	68	68	66	65	64	64	66	68	68	68	66	65	66	68	66	66	66	66	64	67
September	60	60	60	64	64	64	64	64	64	60	59	57	64	59	54	54	57	57	57	57	59	59	60	60	57	53	55	57	57	57	-	59
October	57	55	54	54	52	50	50	50	50	51	50	50	51	53	53	53	53	53	53	53	53	53	53	54	54	52	54	54	54	50	46	52
November	44	43	43	46	44	44	43	43	43	43	39	38	36	36	36	36	35	37	37	39	35	36	37	37	39	39	39	39	37	37	-	39
December	35	35	35	37	39	34	34	34	34	34	34	35	35	34	34	35	35	35	35	35	34	35	35	35	35	36	36	33	34	33	33	35
Water temperatures (°F), calendar year 1928																																
January	33	33	33	35	35	35	33	35	35	35	35	35	35	35	33	35	35	35	35	34	34	35	34	34	34	35	35	35	35	36	36	35
February	36	36	36	36	37	36	36	36	36	36	36	36	35	35	35	35	35	35	35	35	35	35	33	33	35	35	35	35	35	-	-	35
March	35	35	35	35	35	35	36	35	36	36	36	39	37	38	37	39	39	40	43	43	45	46	46	45	41	39	39	39	39	39	39	39
April	39	42	42	42	41	41	39	39	39	41	40	40	39	40	41	43	44	44	43	43	45	46	47	50	50	50	50	50	50	47	-	44
May	48	48	50	50	52	54	55	53	55	53	53	53	53	53	51	54	56	57	57	57	57	59	60	60	60	60	61	60	60	60	59	55
June	60	61	60	61	61	61	59	57	55	57	60	61	61	64	64	61	59	58	55	55	55	55	57	59	61	64	64	64	65	64	-	60
July	63	63	62	66	66	67	66	64	67	68	69	70	70	70	70	71	68	68	66	68	68	70	72	75	75	75	75	72	72	70	70	69
August	70	68	68	68	68	68	68	68	68	70	70	70	69	68	64	64	65	66	66	66	66	67	64	65	64	61	59	59	58	61	63	66
September	65	67	68	68	68	68	65	61	57	52	52	54	53	54	54	54	54	55	55	54	54	54	54	58	58	57	55	54	54	55	-	58
October	55	54	53	53	52	51	52	54	54	55	53	46	45	45	46	48	50	50	50	50	50	48	48	48	48	50	48	48	48	46	46	50
November	45	45	45	45	42	42	42	42	42	42	42	42	42	42	42	42	41	40	39	39	41	41	43	43	41	39	39	39	37	37	-	41
December																																--
Water temperatures (°F), calendar year 1930																																
January	36	36	36	--	36	34	34	34	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	36	36	36	36	36	36	34
February	36	36	36	36	37	37	37	37	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	35	-	-	-	36
March	34	34	34	34	35	34	35	36	35	38	37	39	39	39	40	39	39	39	39	39	37	37	40	39	39	39	39	41	43	39	39	38
April	43	43	45	46	46	46	48	50	50	50	50	48	48	48	46	46	46	46	48	50	48	49	49	53	53	54	49	53	53	53	-	49
May	53	55	57	56	58	54	54	54	54	54	54	54	58	59	54	55	57	57	57	57	57	54	54	54	57	57	61	63	64	62	64	57
June	58	59	59	58	58	59	63	66	65	67	69	66	61	68	60	60	66	64	66	68	66	66	66	66	65	68	68	68	64	64	-	64
July	70	68	68	68	68	74	72	72	76	75	75	72	72	73	75	76	72	72	72	--	70	69	71	72	72	72	72	68	68	68	72	71
August	72	72	71	71	72	72	72	75	76	76	73	75	75	75	72	70	70	70	70	70	70	70	72	72	70	70	56	68	68	66	64	71
September	65	63	61	65	65	66	65	65	63	65	65	65	63	59	57	57	57	61	59	57	57	59	58	53	54	54	56	56	59	59	-	60
October	57	58	55	57	56	58	57	57	55	55	54	53	51	51	48	45	42	41	39	39	36	39	41	43	41	46	41	40	45	44	43	48
November	44	45	50	50	45	45	45	45	45	45	45	45	43	39	36	36	36	36	36	36	36	36	36	38	39	39	39	39	40	44	-	41
December	39	39	39	39	39	39	39	37	37	37	37	37	37	37	39	37	37	32	36	36	36	36	36	36	36	36	36	36	36	36	36	37

86 . Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1931																																
January.....	36	36	36	36	36	36	36	36	36	36	35	36	36	36	36	36	36	36	36	36	34	36	36	36	36	36	36	36	39	37	37	36
February.....	36	36	36	36	36	36	36	36	36	36	38	--	36	37	38	39	39	39	39	40	40	39	39	39	39	39	39	40	-	-	-	38
March.....	39	41	41	43	39	35	36	36	37	39	38	38	39	40	38	43	43	45	45	47	45	--	46	48	--	36	--	36	36	39	39	40
April.....	--	44	44	44	36	46	50	50	48	48	49	50	52	50	50	50	50	50	46	46	46	42	42	42	46	48	50	51	54	56	-	48
May.....	54	55	57	55	54	54	54	54	53	54	54	56	58	61	62	63	59	52	50	50	50	50	57	63	63	64	57	60	59	61	64	57
June.....	64	64	64	62	59	60	61	64	61	61	63	64	64	64	65	68	61	63	63	65	--	68	68	68	68	68	68	70	69	68	-	65
July.....	61	--	61	62	64	61	61	64	66	70	70	68	68	68	68	68	68	72	70	72	72	72	72	72	73	74	75	75	71	72	68	69
August.....	66	68	67	69	68	68	68	67	66	64	66	68	69	68	68	68	68	68	70	68	71	68	68	68	68	68	64	63	64	66	64	67
September....	64	64	64	66	66	66	68	68	63	61	55	55	57	57	57	57	57	57	57	57	57	54	52	52	50	52	54	57	57	57	-	59
October.....	57	57	57	55	55	55	52	50	50	50	50	50	50	50	50	52	52	53	53	53	53	53	52	50	48	48	46	44	44	44	41	51
November.....	46	48	48	48	48	47	49	48	47	46	46	42	41	41	40	37	37	36	36	36	35	35	36	35	36	34	34	36	35	35	-	41
December.....	35	36	36	36	36	36	36	37	36	36	36	35	36	36	36	36	37	39	39	39	37	37	37	37	39	37	39	39	39	36	36	37
Water temperatures (°F), calendar year 1932																																
January.....	36	36	36	36	36	36	36	38	38	39	39	39	35	35	35	36	36	37	39	39	39	39	38	36	39	39	36	36	36	34	34	37
February.....	34	34	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	37	37	37	37	38	39	39	42	43	39	40	-	-	37
March.....	39	40	37	37	37	35	36	36	36	36	36	37	36	36	36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
April.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	59	52	52	52	50	48	46	46	46	46	46	46	46	46	46	-	--
May.....	46	50	50	51	52	51	54	54	57	60	59	59	64	60	57	56	57	59	59	59	59	59	59	59	59	57	57	57	57	59	60	57
June.....	59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64	61	63	64	64	63	66	68	68	69	68	68	69	71	68	-	--
July.....	69	71	69	64	64	65	64	66	67	66	67	67	69	69	69	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
August.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66	70	63	74	74	70	68	65	65	66	68	68	68	68	67	65	--
September....	63	60	60	62	53	64	--	68	67	64	63	65	61	66	61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
October.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	59	55	53	55	53	55	53	53	53	53	53	51	51	51	40	--
November.....	50	--	--	--	--	--	--	--	--	50	--	50	48	46	46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
December.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	45	42	43	46	45	42	43	43	43	42	42	40	41	41	41	42	--
Water temperatures (°F), calendar year 1933																																
January.....	42	42	42	42	42	43	44	44	45	43	42	42	43	43	44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
February.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	44	43	43	44	44	44	44	45	44	33	45	44	45	-	-	-	--
March.....	45	45	45	--	45	43	43	40	37	36	38	38	39	39	39	40	39	41	40	44	44	44	43	43	44	44	46	48	50	48	50	42
April.....	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	48	48	46	44	42	42	44	50	50	50	50	58	50	50	50	-	--
May.....	48	47	47	50	50	51	49	50	49	49	49	48	51	53	56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66	66	66	63	63	65	63	66	67	68	70	65	68	64	64	-	--
July.....	64	64	68	68	68	68	69	69	69	71	71	71	71	71	71	73	71	71	68	69	68	68	68	71	73	75	75	75	74	70	68	70
August.....	68	68	68	68	71	70	--	--	70	70	69	69	69	69	69	69	69	69	70	69	68	63	59	61	59	57	54	61	62	64	65	64
September....	63	64	65	63	65	64	64	61	60	61	60	60	60	63	61	61	57	61	57	57	59	58	54	52	50	50	50	53	54	54	-	59
October.....	52	54	55	57	57	57	57	58	58	57	57	55	54	53	53	53	50	50	46	46	44	43	43	43	43	46	46	50	50	50	50	51
November.....	47	46	45	42	40	39	35	40	40	41	43	43	45	46	46	46	44	49	43	43	43	42	43	43	45	45	45	43	39	37	-	43
December.....	37	38	38	38	36	36	37	36	36	36	35	35	35	35	34	34	34	36	36	36	36	37	36	34	34	34	35	34	35	36	34	36

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1934																																
January.....	34	35	36	36	35	35	35	35	35	35	37	35	36	36	36	36	36	36	36	36	36	36	36	35	35	36	37	36	36	36	37	36
February.....	39	39	41	40	39	41	39	41	42	42	41	40	41	42	42	42	44	44	44	45	40	41	35	34	34	34	36	36	-	-	-	40
March.....	36	37	37	37	39	39	37	37	38	39	41	41	41	45	46	49	48	46	46	48	50	48	43	41	42	40	43	42	39	39	43	42
April.....	39	43	36	43	45	47	50	50	50	50	50	50	54	52	47	46	48	50	50	52	53	52	54	54	53	53	54	54	54	54	-	50
May.....	54	54	56	55	55	55	59	59	57	54	55	54	54	54	57	61	61	60	61	61	57	57	59	61	63	64	68	68	68	68	63	59
June.....	60	57	57	60	61	61	57	54	53	57	61	64	64	64	65	65	65	68	67	65	66	66	64	64	68	68	64	65	66	68	-	63
July.....	70	71	70	70	70	67	68	67	68	68	68	68	69	68	69	72	72	72	74	74	74	72	72	71	67	68	72	72	73	75	75	71
August.....	68	68	68	69	69	72	72	72	72	72	72	70	68	68	70	71	72	70	68	70	72	67	64	62	61	64	64	66	68	68	64	68
September....	64	61	61	61	61	62	63	63	61	61	61	61	61	59	57	60	60	60	60	55	54	53	46	43	43	43	45	46	50	52	-	56
October.....	54	54	55	55	55	52	55	57	58	62	59	50	59	55	54	52	48	48	50	50	50	50	50	46	46	48	46	46	46	46	46	52
November.....	52	46	42	44	45	46	46	48	48	47	47	47	48	48	48	48	46	46	44	43	41	39	39	39	39	39	39	39	39	39	-	44
December.....	39	39	38	37	39	38	39	39	39	39	39	39	40	39	39	39	39	37	36	36	36	37	36	35	35	34	34	35	35	35	36	37
Water temperatures (°F), calendar year 1935																																
January.....	36	36	36	37	37	36	37	37	36	36	36	35	35	35	35	35	35	33	33	33	33	33	33	35	36	36	36	36	36	36	36	35
February.....	37	38	38	38	37	37	36	35	36	36	36	36	36	35	36	36	37	37	37	38	39	37	41	37	38	36	37	37	-	-	-	37
March.....	38	38	40	41	37	36	35	35	35	35	36	37	37	39	39	42	42	42	42	42	39	39	39	38	41	39	39	40	39	38	38	39
April.....	38	37	37	37	39	39	41	43	41	39	41	43	46	42	44	46	46	48	48	50	53	50	50	50	50	50	49	47	46	48	-	45
May.....	48	48	50	50	54	54	52	50	54	53	51	53	50	50	52	54	57	57	57	57	57	59	59	57	56	55	56	55	56	57	61	54
June.....	61	57	57	61	61	57	57	60	62	64	64	64	63	63	61	61	61	63	64	63	63	64	67	67	63	65	64	68	68	68	-	63
July.....	64	64	64	68	68	68	68	68	68	68	68	68	73	75	76	77	76	77	75	73	72	71	71	72	73	73	75	75	71	72	72	71
August.....	72	64	64	68	66	66	68	68	68	73	72	72	71	71	68	66	66	64	64	64	66	68	72	68	68	64	64	64	64	64	64	67
September....	64	64	64	62	63	64	61	61	63	63	64	63	64	63	64	62	61	60	59	61	61	63	63	61	61	57	54	54	55	57	-	61
October.....	57	59	59	59	57	59	58	58	54	54	54	55	55	54	54	53	50	50	51	50	50	49	46	46	46	46	48	48	43	37	36	51
November.....	36	35	35	35	35	37	36	38	39	37	37	37	36	36	36	36	36	36	36	36	37	39	39	39	40	40	40	40	41	41	-	37
December.....	39	39	38	37	37	36	37	37	36	36	37	37	39	37	35	35	37	36	35	36	36	36	36	36	36	36	36	37	36	37	36	37
Water temperatures (°F), calendar year 1936																																
January.....	36	36	36	35	36	35	35	--	36	36	36	36	36	36	36	35	35	35	35	35	35	35	35	37	36	36	36	36	36	36	36	36
February.....	36	35	34	34	34	34	34	33	34	35	35	34	34	34	33	33	33	33	33	33	34	36	36	36	36	36	36	36	37	-	-	35
March.....	37	37	37	36	37	37	39	39	39	37	35	39	37	37	37	37	37	38	39	43	43	39	39	39	36	35	39	37	36	36	36	38
April.....	36	35	35	35	35	35	35	39	39	43	46	48	49	50	50	51	54	54	55	56	52	52	53	50	50	50	50	50	50	53	-	46
May.....	53	53	53	57	59	57	51	53	54	57	59	59	57	57	61	57	57	57	58	57	57	55	56	59	59	63	67	68	68	69	71	59
June.....	71	71	60	57	61	62	61	57	59	60	64	66	66	67	69	68	66	66	64	66	69	70	73	76	76	75	75	75	71	68	-	67
July.....	69	71	72	72	72	73	74	75	74	74	74	72	--	72	73	73	72	75	75	77	79	78	81	78	78	77	75	75	75	75	75	75
August.....	75	75	72	67	68	71	72	72	72	73	72	75	75	73	72	71	71	72	69	68	69	68	69	68	68	68	68	66	66	67	68	70
September....	68	68	66	66	66	64	64	64	64	64	63	62	61	59	57	55	56	57	60	60	64	64	60	60	61	57	57	57	57	57	-	61
October.....	55	54	55	56	56	55	57	57	57	57	57	58	57	57	56	55	55	55	53	51	50	53	46	46	46	46	46	46	47	50	45	52
November.....	44	39	39	37	39	38	36	36	36	37	39	40	42	42	44	44	46	46	46	46	46	45	43	42	42	41	39	39	39	39	-	41
December.....	39	37	35	36	36	35	35	36	36	36	37	35	35	35	37	37	39	36	38	37	36	37	37	38	36	36	36	36	36	36	36	36

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1937																																
January	35	35	36	36	36	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	36	36	36	36	36	36	36	36	34	35	35
February	35	35	35	35	35	35	35	35	35	36	37	35	35	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	-	-	-	36
March	37	37	37	37	39	39	37	39	39	39	39	37	36	36	36	37	36	36	36	36	36	37	37	37	37	38	37	37	38	40	43	37
April	44	44	42	46	46	46	46	46	46	46	46	47	48	48	47	45	45	46	46	46	47	46	46	45	46	50	53	54	55	53	-	47
May	55	57	57	57	60	60	57	57	57	58	57	54	57	56	57	57	58	60	61	61	59	59	59	58	59	62	63	66	63	60	59	59
June	60	60	64	60	58	57	57	57	59	59	61	61	60	61	61	64	66	65	69	61	63	66	68	65	64	64	68	69	71	75	-	63
July	75	75	74	75	75	72	72	73	75	75	75	74	73	73	72	71	70	72	73	75	75	76	75	75	75	77	73	73	73	72	72	74
August	68	65	64	64	66	68	68	70	71	70	70	70	71	72	72	71	71	71	70	68	63	69	71	68	67	67	67	67	64	64	64	68
September	64	66	66	67	68	66	66	66	67	67	68	67	68	67	68	67	68	68	66	68	68	64	62	59	57	56	57	54	55	54	-	64
October	54	55	57	56	55	54	54	54	54	55	56	55	54	52	53	53	53	53	51	51	51	50	52	54	54	54	55	55	55	54	50	54
November	53	50	48	48	47	46	45	45	45	46	46	46	42	44	44	42	41	39	39	39	39	39	39	41	42	43	41	41	40	39	-	43
December	39	39	39	39	39	39	39	36	35	35	37	37	37	37	39	37	38	38	38	38	38	37	36	36	36	36	36	36	36	37	36	37
Water temperatures (°F), calendar year 1938																																
January	36	37	37	37	37	37	39	39	39	39	39	37	39	39	39	39	39	39	37	37	37	38	38	37	37	38	39	37	36	35	34	38
February	35	36	36	37	39	37	39	37	37	37	35	35	35	35	35	35	35	37	37	37	37	37	37	37	38	39	39	39	-	-	-	37
March	39	39	38	34	35	34	35	34	35	35	38	39	39	40	41	43	44	43	43	43	42	42	41	42	44	45	46	46	44	39	39	40
April	37	39	39	43	46	45	46	46	47	48	49	50	51	51	52	53	53	53	53	53	50	49	52	51	52	50	50	51	54	55	-	49
May	57	54	52	50	50	50	49	49	50	51	53	54	54	54	54	57	58	57	55	51	52	55	57	60	59	60	61	61	58	58	57	55
June	54	61	61	61	62	62	61	60	60	60	60	60	63	64	63	66	66	64	63	64	68	66	63	61	61	61	64	66	66	68	-	63
July	67	66	66	66	66	65	67	68	69	69	70	70	72	72	73	72	72	73	75	75	75	75	75	73	68	68	68	69	70	71	71	70
August	71	72	70	69	70	71	71	71	71	70	71	72	72	70	66	65	66	68	64	64	64	65	65	66	66	70	70	70	71	71	71	69
September	72	71	71	70	71	69	68	68	66	64	62	63	64	64	66	66	65	65	66	66	66	66	68	68	68	66	65	65	64	64	-	66
October	63	64	64	61	61	60	57	57	58	57	57	55	55	52	51	50	49	48	48	48	50	50	50	51	52	52	53	52	53	53	52	54
November	52	52	51	48	48	44	43	43	43	43	43	41	41	41	41	41	41	42	43	43	39	39	36	36	36	36	36	38	38	39	-	42
December	40	39	39	38	39	39	39	40	43	41	40	37	35	35	35	36	36	35	35	35	35	35	36	37	36	35	35	35	35	36	36	37
Water temperatures (°F), calendar year 1939																																
January	37	37	37	36	36	35	35	37	37	37	37	37	36	36	36	37	36	36	37	37	37	36	36	36	36	35	35	36	36	36	35	36
February	35	35	36	36	36	36	35	35	35	35	35	35	35	35	35	35	36	37	36	36	36	36	37	36	37	37	37	37	-	-	-	36
March	37	37	37	36	36	37	37	37	37	37	37	38	37	36	36	36	36	36	36	37	38	44	46	44	44	43	42	39	40	43	43	39
April	45	45	46	46	43	41	39	42	43	43	43	45	45	45	48	46	46	46	49	50	52	54	54	57	54	52	53	54	57	59	-	48
May	54	55	55	58	59	56	55	53	55	55	55	57	57	59	62	64	64	61	61	58	57	59	57	57	57	57	63	65	65	66	64	59
June	63	59	61	62	62	59	59	57	61	61	61	62	62	62	61	60	60	58	58	60	62	64	64	63	61	60	63	65	68	75	-	62
July	72	72	72	68	68	67	66	68	70	73	72	73	73	72	75	75	72	70	72	72	67	68	69	71	72	72	75	75	75	75	75	71
August	74	73	73	75	75	73	68	66	64	61	61	64	64	66	68	69	71	71	71	70	68	68	68	68	68	68	70	71	71	68	68	69
September	68	68	66	64	66	65	62	64	64	64	64	64	61	61	59	58	60	61	61	61	62	64	64	64	60	59	59	57	54	57	-	62
October	57	57	55	55	55	54	54	52	52	52	53	53	52	54	54	52	52	52	52	51	51	51	52	50	47	45	45	45	45	46	46	51
November	47	48	49	49	48	47	46	46	45	39	42	42	43	43	44	44	45	45	44	43	43	44	43	45	43	42	42	41	41	42	-	44
December	42	42	42	42	43	43	43	43	44	45	45	43	41	41	41	42	43	42	42	42	41	39	37	36	34	35	36	36	36	37	37	40

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																												Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1940																																
January.....	36	36	36	36	36	36	36	36	36	36	36	37	36	36	36	37	36	35	36	36	36	36	36	35	35	35	36	36	37	37	37	36
February.....	36	36	36	36	37	37	37	36	37	37	37	37	36	37	38	37	37	37	36	36	36	36	36	35	35	35	35	35	36	-	-	36
March.....	37	39	38	38	38	38	38	39	40	39	39	40	40	41	43	44	43	43	44	43	43	45	43	41	41	40	41	43	44	45	46	41
April.....	46	45	44	42	43	44	46	47	47	44	41	43	45	49	50	49	49	50	50	53	52	50	50	50	49	49	48	50	51	51	-	48
May.....	52	53	57	57	55	53	52	54	57	60	62	61	61	57	57	57	59	57	60	60	60	61	62	65	68	68	68	68	68	68	66	60
June.....	67	66	66	65	67	65	64	63	59	61	64	68	70	68	68	68	68	68	69	70	70	69	65	67	68	69	68	68	71	72	-	67
July.....	71	69	70	72	72	72	72	72	75	74	74	75	75	75	75	75	75	75	75	75	75	76	76	77	75	72	72	68	70	71	72	73
August.....	73	73	72	72	71	71	72	73	75	75	75	75	75	75	75	74	71	70	70	71	72	72	71	70	71	71	71	71	68	68	69	72
September....	71	72	72	71	70	68	67	67	67	66	67	68	67	67	66	66	66	66	66	64	66	66	65	64	63	63	64	64	64	61	-	66
October.....	63	61	60	58	57	56	57	57	57	58	57	56	57	50	50	55	54	56	57	58	58	56	56	55	55	55	55	52	52	50	50	55
November.....	49	49	49	48	46	46	45	43	42	38	36	36	36	37	52	39	38	39	41	41	41	39	37	38	38	38	38	39	40	40	-	41
December.....	--	39	39	39	40	40	41	41	41	41	40	39	36	36	37	37	37	37	38	39	39	39	39	39	39	39	39	39	39	39	39	39
Water temperatures (°F), calendar year 1941																																
January.....	38	37	36	36	36	36	36	36	36	39	39	39	39	--	38	37	37	37	39	39	37	39	37	36	36	36	37	37	38	38	38	37
February.....	39	38	39	38	39	39	38	38	39	39	40	40	39	39	37	37	37	39	37	37	37	37	36	36	36	36	37	37	-	-	-	38
March.....	37	37	37	37	37	38	41	43	43	43	42	40	39	--	37	--	37	37	37	39	46	46	46	--	--	46	46	46	46	46	47	41
April.....	47	48	48	50	50	50	49	49	49	51	51	51	51	49	51	49	49	46	45	46	49	50	53	53	53	52	54	55	56	57	-	50
May.....	58	60	60	61	--	57	55	57	57	54	--	62	63	64	--	62	61	61	59	59	60	61	61	62	63	64	63	61	61	62	64	60
June.....	64	63	64	64	63	63	63	63	--	63	63	65	68	68	68	68	69	69	69	69	68	68	72	--	74	74	72	71	68	66	-	67
July.....	65	68	72	72	73	--	--	74	74	74	75	74	74	74	--	74	77	78	79	78	78	76	73	--	70	--	71	72	71	71	72	73
August.....	72	--	--	72	72	--	73	77	78	77	77	77	76	76	73	73	73	72	72	73	73	73	75	71	70	61	65	65	--	66	66	72
September....	66	66	66	--	65	65	64	62	61	61	61	61	60	59	58	57	57	--	61	61	60	59	59	59	57	57	52	52	--	53	-	60
October.....	55	55	56	55	53	51	51	50	50	50	53	53	--	53	53	53	53	54	53	52	53	52	51	50	51	--	51	51	49	49	46	52
November.....	46	46	46	47	48	48	47	47	48	47	48	48	--	48	48	48	47	45	43	41	41	41	38	--	38	38	38	43	43	44	-	45
December.....	45	46	46	46	44	--	42	41	40	39	--	38	38	39	39	40	41	41	41	--	41	--	39	39	39	38	37	37	38	38	38	40
Water temperatures (°F), calendar year 1942																																
January.....	37	36	36	36	36	36	36	36	37	37	38	38	39	38	37	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	38
February.....	38	38	38	38	38	38	38	38	39	38	38	38	38	36	38	36	37	37	37	39	39	39	38	38	37	37	37	38	-	-	-	38
March.....	37	38	37	38	38	37	37	38	39	39	37	37	37	37	39	39	39	39	41	40	41	42	42	42	42	41	40	40	42	40	44	39
April.....	42	42	47	47	45	46	44	44	43	43	43	43	43	43	43	43	47	47	48	50	52	54	54	50	52	52	50	52	52	50	-	47
May.....	53	55	54	54	53	55	56	56	57	57	57	57	57	57	54	52	51	52	53	55	58	60	62	62	62	59	53	57	57	55	54	56
June.....	56	59	61	61	60	60	61	62	62	62	62	60	60	61	64	63	61	61	64	62	62	62	62	62	64	63	61	61	61	65	-	62
July.....	68	69	69	66	66	68	68	70	70	75	75	73	71	72	72	73	73	71	69	69	70	73	75	76	76	73	70	70	72	71	71	71
August.....	71	71	70	70	70	70	75	75	75	75	75	75	73	68	68	68	69	70	73	75	76	71	69	70	70	70	69	55	68	68	67	71
September....	65	62	62	66	68	68	68	69	69	69	68	66	68	64	64	64	60	58	58	58	60	63	62	52	59	59	58	58	58	59	-	63
October.....	60	62	61	60	59	59	60	60	60	61	60	60	59	57	57	56	57	57	58	58	56	55	50	50	46	45	46	46	46	49	48	55
November.....	47	47	47	47	46	46	46	44	44	46	46	46	46	47	47	47	44	44	41	41	40	41	41	41	43	41	43	41	39	39	-	44
December.....	39	39	39	39	39	37	37	37	37	39	38	39	39	39	39	39	39	37	37	37	38	39	38	37	39	39	38	39	38	39	39	38

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1943																																
January.....	39	39	39	39	39	39	39	38	39	39	39	38	39	40	37	37	35	34	34	34	33	38	38	37	37	37	37	38	39	39	39	38
February.....	39	39	39	39	38	38	39	37	38	38	38	36	36	37	37	37	37	37	39	39	39	39	39	39	39	39	39	39	-	-	-	38
March.....	39	39	39	39	38	39	38	39	39	39	39	37	37	36	36	36	36	36	39	39	39	39	39	39	40	39	39	39	39	42	42	39
April.....	42	43	44	44	45	45	46	48	48	48	46	46	48	48	48	50	50	51	52	53	53	52	53	53	53	53	50	50	50	50	-	49
May.....	52	54	55	57	55	53	52	52	52	52	48	48	48	53	53	52	53	53	55	57	60	60	60	57	59	60	60	61	61	62	60	55
June.....	59	59	56	51	52	52	53	57	57	57	60	60	59	57	56	57	58	60	62	60	60	62	62	60	62	64	64	64	64	65	-	59
July.....	64	60	60	61	61	62	64	66	72	72	70	68	65	65	68	69	69	68	68	71	75	75	71	75	75	75	73	73	72	72	72	69
August.....	71	72	69	70	70	73	75	74	72	72	72	72	71	71	71	71	71	73	71	71	71	71	69	68	69	68	68	68	68	68	67	71
September....	65	65	64	64	64	63	62	61	61	64	64	66	68	68	66	64	64	62	59	60	60	61	61	60	60	61	61	61	61	60	-	63
October.....	63	63	61	62	63	63	62	62	62	62	62	60	60	57	57	56	55	54	55	53	53	48	48	47	47	48	49	50	57	55	53	56
November.....	50	50	48	48	47	47	47	47	46	47	47	47	47	47	47	47	47	48	48	45	44	43	43	42	41	43	43	43	43	43	-	46
December.....	43	43	42	46	46	42	42	42	39	40	39	39	39	39	39	40	36	37	37	36	35	34	34	39	39	--	37	39	39	39	39	39
Water temperatures (°F), calendar year 1944																																
January.....	39	39	39	39	39	39	39	38	39	39	37	39	39	35	35	36	36	36	36	36	39	39	39	39	39	39	39	39	39	39	39	38
February.....	39	39	39	39	37	39	39	39	39	37	35	35	35	35	34	34	34	39	39	39	39	39	39	39	39	39	39	39	39	-	-	38
March.....	39	39	39	38	37	37	37	39	39	37	36	36	35	35	36	36	39	39	39	39	39	40	42	42	41	41	39	39	39	41	44	39
April.....	46	46	46	50	50	51	46	46	46	46	46	46	46	50	50	50	50	51	50	50	51	51	51	51	53	53	53	53	54	54	-	50
May.....	55	53	51	53	52	52	52	52	52	54	57	61	62	63	64	64	64	65	60	60	60	59	59	59	57	57	60	64	66	68	68	59
June.....	65	63	63	59	57	55	57	59	62	61	61	63	64	61	62	57	57	59	59	66	62	62	61	62	64	65	63	59	63	65	-	61
July.....	66	66	66	66	67	67	68	66	68	67	68	69	70	69	69	69	71	71	73	73	74	74	73	74	72	70	72	72	72	72	72	70
August.....	72	70	70	70	70	71	72	72	72	71	71	69	69	69	66	64	64	66	66	67	68	68	68	70	68	67	66	66	65	65	66	68
September....	71	70	70	68	68	69	70	69	69	69	68	68	68	68	63	59	59	57	56	56	57	58	58	59	61	61	60	59	61	59	-	64
October.....	57	56	57	57	59	57	57	54	54	54	54	54	55	55	57	57	57	55	55	54	54	54	54	54	54	54	55	55	54	54	54	55
November.....	54	53	51	50	50	50	46	50	50	52	52	45	44	44	44	44	43	43	42	42	43	43	43	46	46	45	44	43	43	42	-	46
December.....	42	42	42	42	42	42	42	44	41	39	37	37	37	37	35	36	37	36	36	36	36	39	39	39	39	39	39	39	39	39	39	39
Water temperatures (°F), calendar year 1945																																
January.....	39	39	39	39	37	37	37	37	37	37	38	37	37	37	37	37	37	37	39	39	39	39	39	39	39	39	39	39	39	39	39	38
February.....	39	33	33	33	33	33	33	33	37	36	36	36	36	36	36	38	38	38	38	39	39	39	39	39	39	39	39	39	-	-	-	37
March.....	39	34	34	33	33	34	34	34	36	36	36	36	36	36	37	42	42	42	43	43	45	46	50	50	50	50	46	40	48	48	48	41
April.....	46	44	41	41	43	45	45	46	46	46	46	44	45	47	48	47	47	47	49	49	49	49	49	49	49	49	46	48	50	51	-	47
May.....	52	53	55	57	57	57	55	54	52	54	54	52	51	52	51	52	52	58	58	58	58	57	57	57	59	59	59	59	56	57	61	56
June.....	61	61	60	59	58	54	54	52	52	53	52	53	54	53	56	55	52	55	55	55	55	66	66	64	63	62	62	62	59	59	-	57
July.....	60	60	64	66	64	65	67	68	69	69	69	69	70	70	70	69	69	69	69	70	70	70	70	70	73	73	73	73	73	72	72	69
August.....	72	72	70	70	70	69	69	69	69	72	72	72	72	72	72	72	75	73	72	68	68	66	68	68	68	68	66	66	66	66	67	70
September....	67	67	67	67	67	66	66	66	62	62	62	60	61	61	61	61	59	57	55	51	51	54	51	50	50	53	52	51	51	51	-	59
October.....	51	51	51	51	59	59	59	59	57	57	57	59	56	55	55	55	55	55	55	50	48	48	46	45	45	48	47	48	48	47	48	52
November.....	48	48	48	48	48	46	39	36	36	36	36	36	37	36	37	37	39	39	39	39	39	37	35	35	35	35	35	35	35	37	-	39
December.....	35	35	35	35	35	35	37	37	35	35	35	35	35	35	34	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	34

86 . Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1946																																
January.....	33	33	33	33	33	33	33	33	33	33	34	34	34	34	34	35	35	34	34	33	34	34	34	34	32	32	32	32	32	32	32	33
February.....	35	35	35	35	35	30	36	35	35	35	35	34	34	34	37	37	37	36	37	37	37	33	33	33	33	33	33	33	-	-	-	35
March.....	39	39	42	41	41	42	40	39	39	39	39	40	40	41	41	41	41	41	43	44	44	44	44	42	44	44	46	46	47	46	46	42
April.....	46	46	46	46	46	45	45	45	45	45	46	50	50	50	51	51	51	51	51	--	51	51	51	51	51	56	54	54	54	57	-	50
May.....	53	53	53	53	56	54	54	54	54	50	50	50	52	52	52	52	60	60	61	60	60	59	58	57	59	60	64	64	60	57	54	56
June.....	54	55	56	57	59	59	57	57	57	60	62	62	62	64	64	64	62	62	62	62	68	68	68	65	64	64	64	57	58	58	-	61
July.....	60	64	64	64	73	71	71	71	70	66	66	72	72	73	73	73	73	73	71	71	71	70	70	70	71	70	71	70	70	68	68	70
August.....	65	66	66	66	68	71	68	66	66	66	66	68	68	68	68	68	66	66	68	69	71	71	72	72	72	68	68	66	66	66	64	68
September....	62	62	62	62	62	60	60	59	59	59	57	59	65	65	66	64	63	61	59	54	54	52	51	52	54	54	54	57	56	56	-	59
October.....	56	57	57	54	53	53	52	53	53	38	50	50	50	52	50	46	46	45	45	45	50	50	50	50	48	48	46	44	44	44	40	49
November.....	40	40	40	39	39	39	39	44	46	44	44	43	43	43	43	43	41	40	38	37	35	37	37	37	37	37	37	37	37	37	-	40
December.....	37	37	39	39	39	39	39	39	39	39	40	39	35	34	35	35	35	35	35	35	37	37	37	37	37	37	37	37	37	37	36	37
Water temperatures (°F), calendar year 1947																																
January.....	37	36	38	39	39	39	38	39	39	37	37	36	36	36	36	36	36	36	37	37	37	37	37	37	37	37	37	37	37	37	38	37
February.....	37	37	36	38	39	39	39	39	38	38	39	39	39	37	37	37	37	37	37	37	37	37	37	37	37	35	35	37	-	-	-	37
March.....	36	39	37	37	36	37	35	35	35	35	36	36	36	38	37	37	37	37	37	39	35	36	36	35	35	35	37	43	44	46	46	37
April.....	46	46	46	43	41	41	42	42	43	44	44	46	46	46	46	46	48	42	42	42	50	48	47	47	50	52	53	55	57	53	-	46
May.....	53	52	52	55	54	54	54	55	53	57	57	56	56	56	56	58	59	59	59	57	58	59	57	59	60	60	60	57	57	57	60	57
June.....	60	59	59	59	59	59	59	59	59	59	59	58	60	60	60	61	61	61	63	64	60	60	64	64	64	64	64	64	63	63	-	61
July.....	64	66	68	66	66	66	67	68	68	68	71	68	68	68	70	72	72	71	75	73	75	75	71	71	69	70	70	70	70	69	69	69
August.....	70	70	70	72	72	70	70	70	70	70	68	68	52	64	68	68	69	68	68	69	69	70	68	64	64	66	66	68	68	68	68	68
September....	68	66	66	66	66	56	64	63	61	61	60	63	63	60	60	58	56	53	53	50	53	57	59	61	61	61	61	61	60	60	-	60
October.....	59	59	59	59	59	59	56	54	54	57	55	55	56	57	55	55	55	55	55	53	55	53	53	50	50	50	51	52	52	52	51	55
November.....	52	50	49	48	46	45	46	46	46	46	46	46	46	46	44	44	43	42	41	43	41	38	38	38	38	38	38	40	40	40	-	43
December.....	40	38	36	36	36	--	38	36	36	36	36	36	39	41	38	39	39	39	38	38	38	38	38	38	38	38	39	40	38	38	36	38
Water temperatures (°F), calendar year 1948																																
January.....	37	36	36	36	39	39	39	38	38	39	38	39	38	39	39	38	37	36	36	36	37	38	36	36	36	34	34	34	34	39	39	37
February.....	38	37	36	39	37	37	37	37	36	36	36	36	36	36	36	36	36	36	35	36	36	36	36	36	36	36	39	39	39	-	-	37
March.....	39	38	38	38	39	37	37	36	36	35	35	37	37	37	37	37	37	41	40	38	38	38	38	38	38	39	39	39	42	42	41	38
April.....	41	42	42	42	42	41	41	41	41	44	43	43	43	43	44	48	48	48	48	48	48	48	50	50	50	50	48	50	50	50	-	46
May.....	50	50	50	50	50	50	50	52	52	49	48	48	48	52	52	52	54	56	56	56	55	56	57	57	67	60	60	60	60	60	60	54
June.....	60	60	60	60	60	60	60	60	63	63	63	59	59	63	64	66	64	60	60	60	61	64	64	60	61	61	61	62	64	66	-	62
July.....	67	66	66	66	66	66	66	66	66	66	68	68	68	68	68	68	69	71	71	68	67	68	70	71	71	70	71	70	66	66	66	68
August.....	66	66	66	66	68	68	68	70	70	70	72	70	69	71	71	71	71	72	74	68	66	67	67	68	65	65	66	66	68	68	68	68
September....	68	68	66	66	64	64	62	62	62	64	64	64	64	65	66	64	63	63	62	61	61	61	61	61	55	55	54	54	55	55	--	62
October.....	57	57	57	59	57	55	53	54	53	54	54	55	55	56	56	53	50	48	48	50	50	50	50	51	51	51	51	50	50	50	50	53
November.....	50	50	50	50	50	50	46	46	42	43	43	43	44	44	45	44	43	41	41	41	41	41	41	41	41	41	39	39	39	37	-	44
December.....	37	37	38	38	37	35	36	36	35	34	34	35	35	35	35	34	34	34	34	34	34	35	34	35	35	35	35	35	35	35	36	35

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1949																																
January	36	36	36	36	36	36	36	36	34	34	34	34	35	35	35	35	35	35	35	34	34	34	34	34	34	34	36	36	36	36	36	35
February	36	36	36	34	34	34	34	34	34	35	34	35	34	34	34	34	34	34	34	34	34	34	36	36	37	37	37	37	-	-	-	35
March	38	38	38	38	39	37	38	38	36	36	37	37	36	37	36	37	36	37	39	37	37	37	37	37	39	39	36	38	39	42	42	38
April	43	43	45	45	46	46	48	50	50	49	49	49	49	48	46	46	48	48	50	51	51	50	50	50	51	52	53	53	54	53	-	49
May	53	53	52	52	52	52	53	55	57	59	59	62	64	62	62	64	64	52	52	55	59	57	55	57	58	60	62	62	62	61	61	58
June	60	57	57	59	61	61	62	62	64	68	68	68	68	68	68	66	64	64	64	64	--	66	66	66	65	66	66	63	64	62	-	64
July	60	62	65	69	70	69	68	69	69	71	71	75	71	72	73	74	71	72	70	70	67	64	66	68	68	66	64	64	66	66	68	68
August	71	73	73	74	74	75	70	75	74	72	72	71	70	70	68	68	68	--	70	69	70	70	72	68	68	68	66	66	66	66	66	70
September	66	69	68	66	62	61	--	61	61	63	59	55	54	54	57	59	59	55	57	57	57	59	59	60	61	61	62	60	59	--	-	60
October	61	59	57	57	57	54	50	48	46	46	46	48	48	50	50	51	51	48	43	43	41	40	44	45	47	48	48	50	50	48	48	49
November	48	48	48	46	46	46	46	46	45	45	46	44	45	45	46	45	46	46	46	45	44	44	44	45	45	47	47	46	45	42	-	44
December	42	39	39	39	39	37	37	37	39	40	35	37	35	38	39	37	36	36	36	35	35	37	38	38	37	37	38	36	37	36	34	37
Water temperatures (°F), calendar year 1950																																
January	34	34	--	--	34	36	37	37	36	35	35	35	37	36	35	36	36	36	37	38	38	38	37	37	37	36	34	35	34	34	34	35
February	36	36	36	36	38	38	38	38	37	38	38	37	37	37	37	37	38	38	39	39	38	39	38	36	--	37	36	--	-	-	-	37
March	36	--	39	39	40	39	37	37	38	36	36	36	36	36	36	39	39	38	39	39	41	43	42	39	41	39	39	39	39	--	44	39
April	44	45	46	43	43	45	45	45	45	45	45	46	48	51	50	49	48	46	48	50	--	50	48	48	48	49	48	46	45	45	-	47
May	46	48	48	46	44	47	48	48	48	49	51	56	59	59	59	57	57	56	52	52	52	52	52	--	52	53	56	59	57	55	54	52
June	56	50	50	50	50	55	55	50	49	53	58	61	61	58	60	60	52	52	52	53	53	54	59	59	57	56	56	63	63	67	-	56
July	67	66	66	65	65	65	65	68	66	68	68	66	66	64	64	64	64	64	65	65	67	67	67	68	68	69	70	73	73	67	63	67
August	63	64	69	71	69	68	66	68	69	67	60	69	69	69	69	69	67	67	64	64	65	65	68	66	66	65	66	66	68	68	68	67
September	70	70	71	71	71	70	69	69	66	64	64	60	58	--	57	56	57	57	59	61	62	62	62	62	62	61	59	55	54	52	-	62
October	50	49	50	51	51	51	52	52	52	52	54	54	56	56	57	55	57	54	52	53	52	50	50	50	50	52	52	50	49	48	48	-
November	48	48	48	48	48	48	48	45	41	39	39	39	39	39	41	41	41	39	37	37	38	39	38	41	38	39	41	41	41	40	-	42
December	37	36	36	36	35	35	35	35	36	37	37	37	37	37	38	39	39	39	38	39	41	41	41	41	41	41	41	38	37	37	37	38
Water temperatures (°F), calendar year 1951																																
January	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	36	38	--	39	37	36	37	37	37	36	36	36	36	35	35	--
February	36	36	36	37	37	36	36	36	37	39	36	37	36	36	37	36	36	37	37	37	37	37	37	37	37	37	36	36	-	-	-	37
March	36	36	37	37	36	36	36	36	36	36	35	36	36	32	35	36	34	36	37	37	37	38	37	37	37	37	36	36	38	38	38	36
April	38	35	44	44	45	45	43	45	45	--	43	42	46	44	44	42	43	44	41	38	38	38	38	40	42	44	52	52	53	53	-	43
May	48	45	46	49	52	54	52	52	52	52	52	55	54	53	50	51	55	57	57	57	57	58	58	58	58	55	57	58	57	57	55	54
June	52	41	54	58	55	57	51	54	57	57	60	60	60	60	64	64	64	64	64	60	58	58	57	59	59	59	59	60	61	59	-	58
July	59	61	60	64	65	64	68	68	66	64	64	64	66	66	66	68	68	69	69	69	65	69	68	68	69	69	69	68	73	74	73	67
August	74	72	72	72	70	70	70	70	70	70	68	68	68	66	66	66	66	68	68	68	67	68	68	66	63	63	63	59	58	57	59	67
September	66	66	64	64	64	64	64	66	63	63	61	59	59	59	58	58	62	62	63	62	57	54	54	54	52	54	52	50	64	52	-	60
October	57	57	57	57	57	56	56	57	57	57	57	57	54	54	48	47	45	46	46	45	43	41	--	--	41	--	45	45	46	45	42	51
November	41	39	42	42	41	41	44	43	44	44	44	44	44	42	42	41	40	39	39	39	38	39	37	37	37	39	39	44	40	40	-	41
December	41	41	39	39	39	38	38	38	34	34	35	35	34	33	33	37	--	35	33	33	33	33	33	33	33	33	33	33	37	37	36	35

86. Missouri River at Ryan Dam, near Bla k Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1952																																
January	35	36	36	37	34	34	34	34	34	34	34	34	34	34	35	35	35	35	--	35	35	35	35	34	34	--	37	37	37	37	37	35
February	37	34	34	34	34	34	34	34	37	37	37	37	37	36	36	36	36	36	34	34	34	34	37	37	37	37	37	37	37	-	-	36
March	37	34	34	34	34	34	34	34	34	34	34	34	34	34	36	36	36	36	36	36	36	37	37	37	37	36	37	37	36	36	36	35
April	36	36	37	37	37	39	47	46	44	41	41	41	46	47	48	48	48	49	51	51	50	47	49	51	52	55	55	55	55	55	-	46
May	55	55	52	52	55	55	55	55	55	51	56	59	59	59	59	57	55	56	57	58	57	57	57	57	60	57	59	59	59	55	--	56
June	57	59	59	60	60	64	--	--	64	64	64	64	--	64	64	64	62	60	60	59	60	60	60	60	60	60	60	63	63	64	-	61
July	63	63	64	66	68	66	66	65	65	67	68	68	64	64	65	68	69	69	69	68	--	68	68	69	69	69	69	70	71	70	71	67
August	73	75	75	75	75	74	72	72	70	70	67	67	67	67	68	67	67	67	68	68	68	69	72	72	72	72	72	70	69	68	61	70
September	61	61	63	64	64	66	64	63	63	64	64	63	63	61	61	61	59	59	59	63	63	63	63	63	63	64	64	64	61	61	-	63
October	61	57	57	54	55	54	54	54	55	55	55	55	55	53	51	51	51	51	53	53	53	53	53	53	53	54	54	54	54	50	50	54
November	48	48	48	46	46	45	46	46	45	47	46	46	46	44	46	46	46	46	45	45	41	43	43	43	41	39	37	39	39	37	-	44
December	37	37	37	37	37	37	37	37	37	37	37	35	34	34	34	35	34	34	34	34	34	37	37	37	37	37	36	36	36	36	36	36
Water temperatures (°F), calendar year 1953																																
January	36	36	34	36	36	34	34	34	34	34	34	34	34	34	34	37	37	37	39	39	39	39	39	37	36	36	36	36	36	36	36	36
February	37	37	38	37	37	36	36	36	37	37	37	37	37	37	37	37	37	37	37	37	36	36	36	36	36	36	36	35	-	-	-	37
March	34	34	34	34	35	35	36	37	39	41	41	41	42	45	43	43	43	43	43	43	39	39	39	39	41	43	43	43	43	43	43	40
April	43	41	41	41	41	43	42	42	41	40	41	41	41	41	41	45	43	43	43	45	46	46	50	50	48	50	50	51	49	50	-	44
May	50	50	52	52	52	54	55	54	52	55	52	48	48	50	52	52	54	55	57	57	54	54	52	52	49	50	47	48	49	49	50	52
June	50	54	53	53	52	54	55	55	55	55	56	58	59	57	57	57	57	57	59	59	57	57	57	57	59	59	61	61	6[illegible]	63	-	57
July	62	64	63	63	66	66	66	66	66	70	72	72	72	73	75	73	73	70	69	70	68	68	70	70	70	70	72	70	72	72	74	69
August	74	71	71	71	70	71	71	71	71	70	69	68	70	70	69	68	70	70	70	71	71	70	70	72	65	65	65	66	65	66	67	69
September	67	67	67	64	63	63	63	64	66	66	66	66	66	65	64	64	63	63	65	63	58	59	60	60	60	60	58	58	56	56	-	63
October	56	56	54	54	54	55	55	54	54	57	57	57	57	57	56	55	55	57	57	55	54	53	50	48	48	48	48	50	52	54	54	54
November	54	52	48	48	48	48	48	48	48	47	47	47	49	50	50	50	50	47	46	46	43	43	43	43	41	41	41	43	43	43	-	47
December	43	43	43	43	41	41	38	37	37	40	38	43	41	41	41	40	38	39	39	37	37	36	36	36	36	36	37	37	39	39	39	39
Water temperatures (°F), calendar year 1954																																
January	39	37	37	36	36	36	37	37	39	39	38	38	39	38	36	35	34	35	34	34	33	33	37	36	36	36	36	36	37	37	38	36
February	37	37	37	37	37	39	39	39	39	38	39	39	39	3[illegible]	39	38	39	38	38	39	41	41	41	41	41	43	41	39	-	-	-	39
March	40	36	34	36	36	41	41	43	46	46	46	43	43	43	40	40	40	40	40	40	40	40	40	40	40	40	39	36	35	35	36	40
April	35	35	39	46	46	47	50	49	48	48	48	48	48	48	48	48	48	48	48	48	45	45	45	44	44	48	49	45	43	42	-	46
May	48	43	46	49	49	54	53	53	53	53	53	53	53	53	53	53	53	56	56	63	54	54	53	53	55	53	52	51	54	57	57	53
June	57	54	54	54	54	54	54	54	54	54	54	54	53	56	56	56	57	57	54	5	60	64	65	66	61	63	61	59	57	59	-	57
July	62	64	64	64	69	69	69	69	69	69	68	70	70	70	70	69	69	73	74	74	74	69	65	66	68	70	68	70	69	69	69	69
August	69	69	69	69	68	68	68	67	67	67	68	68	68	70	67	66	64	64	66	70	66	64	66	66	66	68	64	64	64	64	64	67
September	64	64	64	64	64	63	63	62	62	62	63	63	63	64	62	59	59	58	57	57	56	56	56	56	56	61	61	61	61	54	-	61
October	52	47	47	47	46	46	47	50	54	54	54	54	49	49	48	52	52	53	53	53	53	53	53	53	50	50	48	48	48	48	46	50
November	45	44	43	43	43	48	48	48	48	48	47	48	50	50	50	50	50	48	48	48	48	48	48	48	48	48	45	40	39	38	-	47
December	36	35	35	38	38	44	44	41	41	41	41	41	41	39	39	39	39	39	39	39	39	39	39	39	38	37	36	36	36	35	36	39

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1955																																
January	36	36	36	36	36	34	35	39	39	39	39	37	39	39	39	39	36	36	36	36	36	35	35	35	35	35	35	35	36	36	36	36
February	36	36	35	35	37	39	39	39	39	37	37	37	37	37	37	37	36	36	35	36	36	36	36	34	34	35	35	35	-	-	-	36
March	35	35	35	35	37	37	37	39	39	39	39	36	36	36	36	36	36	36	35	35	35	35	35	35	35	35	35	35	35	35	35	36
April	37	46	43	43	43	43	43	46	46	46	46	48	48	48	48	46	46	46	46	46	46	46	46	46	46	48	46	45	45	50	-	46
May	52	53	53	53	50	53	53	53	53	53	53	53	53	53	51	51	51	48	52	54	59	58	56	52	51	52	52	52	52	55	56	53
June	57	57	57	57	57	57	57	57	60	61	61	61	61	61	63	63	63	60	60	60	64	68	70	70	64	64	64	64	65	65	-	62
July	60	60	60	60	60	60	60	60	60	61	61	62	62	64	66	73	73	73	73	73	73	73	75	75	75	71	71	69	69	69	70	65
August	70	70	70	70	70	70	70	72	72	70	70	70	69	69	69	69	69	68	68	70	68	68	69	68	68	68	68	68	65	64	68	69
September	68	68	68	68	68	66	66	66	65	61	59	59	59	62	62	59	70	60	60	60	58	54	54	54	50	50	50	51	51	51	-	60
October	51	51	52	53	54	54	54	52	52	52	53	52	52	52	55	53	53	53	54	53	55	55	46	46	46	46	46	47	48	47	46	51
November	46	43	44	45	48	48	44	44	44	44	44	41	39	39	39	39	39	39	39	37	37	37	37	36	36	37	37	37	37	37	-	40
December	37	37	37	37	37	37	37	37	37	39	39	39	39	39	38	39	39	32	32	32	34	36	38	34	35	35	35	35	35	35	36	36
Water temperatures (°F), calendar year 1956																																
January	36	36	36	36	36	36	39	39	39	39	39	39	39	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	36
February	34	34	35	39	39	39	39	39	39	39	39	39	36	36	36	36	36	36	36	36	35	35	35	35	36	36	36	36	36	-	-	37
March	36	36	39	37	37	37	36	39	38	38	32	34	34	34	34	34	34	34	34	36	38	38	39	42	42	44	42	39	39	39	46	37
April	46	46	46	46	46	46	46	46	46	48	48	48	48	48	48	49	48	48	49	49	49	49	47	47	46	46	46	46	46	46	-	47
May	46	46	48	48	48	48	48	48	50	50	50	50	49	49	50	51	53	55	57	57	57	57	57	57	57	57	57	57	57	57	--	52
June	57	57	57	57	57	57	57	57	60	60	61	61	59	59	60	59	56	54	59	61	60	58	61	64	63	63	63	64	64	68	-	60
July	68	66	68	68	68	68	66	68	68	70	70	72	75	--	68	68	68	68	68	68	75	75	75	75	75	75	75	75	75	68	68	70
August	68	69	69	68	68	68	68	68	68	67	66	66	66	68	68	68	68	68	64	66	67	67	68	68	68	68	68	68	68	68	68	68
September	61	61	61	60	59	60	60	60	60	61	61	62	61	61	61	61	61	61	61	63	60	63	64	64	64	64	64	64	55	56	-	61
October	57	57	57	57	57	54	56	56	56	55	55	55	57	55	53	54	54	54	57	57	57	41	50	50	50	50	48	47	45	45	39	53
November	39	39	46	46	46	45	47	45	47	50	50	50	50	48	46	43	43	43	43	46	46	46	46	46	46	46	45	44	43	37	-	45
December	38	41	42	40	36	35	35	36	39	39	39	39	39	39	39	39	39	39	39	39	39	37	36	36	36	36	36	36	39	40	38	38
Water temperatures (°F), calendar year 1957																																
January	40	39	38	37	38	36	36	36	35	35	35	35	33	33	33	33	33	33	33	33	33	33	33	33	33	37	37	36	36	36	36	35
February	36	36	37	37	37	37	36	36	36	37	37	37	37	37	37	36	36	36	35	35	34	34	34	35	35	36	36	36	-	-	-	36
March	36	36	36	38	35	35	36	36	36	39	39	37	37	37	38	38	37	37	37	38	38	38	39	39	39	40	40	40	40	40	40	38
April	48	43	48	46	46	46	46	46	46	48	46	44	40	43	44	44	45	46	48	48	48	50	50	50	48	48	47	47	50	50	-	47
May	50	50	50	60	60	60	70	65	55	50	52	55	55	55	55	54	55	57	58	57	54	50	48	50	50	50	50	50	50	50	57	54
June	54	55	55	54	57	59	55	58	59	59	59	59	59	58	57	59	59	60	62	62	62	54	56	60	60	60	58	56	58	64	-	58
July	64	63	64	63	63	65	65	65	66	68	71	72	75	75	75	71	71	70	69	69	65	67	68	67	66	69	72	64	66	64	66	68
August	66	66	70	70	70	70	69	69	68	70	71	71	70	68	68	68	69	67	68	67	68	68	66	65	65	57	57	58	58	57	62	66
September	62	61	61	62	62	62	68	66	64	62	63	62	61	59	60	60	60	55	49	49	52	52	52	54	54	56	56	59	60	60	-	59
October	60	60	58	51	50	50	46	46	47	50	50	51	52	52	53	53	53	53	52	52	46	46	46	46	44	44	44	--	50	45	45	50
November	45	45	46	46	46	46	46	46	40	37	36	41	40	40	40	36	36	36	36	36	36	35	35	37	39	40	38	36	36	38	-	40
December	38	38	40	38	38	38	36	35	36	36	35	35	36	41	41	41	41	41	41	41	40	37	35	34	34	34	34	34	34	34	34	37

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1958																																
January	34	34	34	35	35	35	35	35	35	35	35	36	39	35	39	37	39	36	36	36	36	35	35	35	35	35	35	35	35	35	35	36
February	35	36	36	36	36	36	35	35	35	35	35	35	35	35	34	34	34	34	34	34	34	35	35	35	35	35	35	35	-	-	-	35
March	35	35	35	36	36	36	36	36	36	41	41	41	47	39	34	34	33	33	33	34	37	39	40	42	42	42	41	41	49	45	42	38
April	45	45	43	43	46	44	45	46	46	46	46	46	47	48	49	49	49	49	48	48	48	48	48	47	47	46	46	45	45	48	-	47
May	51	53	55	55	55	55	55	55	57	57	58	60	53	57	54	55	56	55	56	55	55	56	57	63	63	63	62	64	66	65	64	58
June	64	65	65	64	64	62	62	62	62	62	59	55	53	55	54	54	54	55	54	56	61	59	61	65	64	65	65	--	64	64	-	60
July	63	62	64	62	60	61	60	60	61	63	65	--	--	--	--	--	--	--	71	71	66	72	72	71	72	70	68	68	68	68	70	66
August	70	70	72	72	70	68	68	70	72	71	71	72	73	72	73	74	74	75	75	72	69	70	70	70	70	69	69	68	68	66	63	71
September	62	62	61	62	63	61	62	68	65	66	68	69	70	68	62	61	65	62	62	59	57	57	57	55	55	54	54	55	55	55	-	61
October	55	55	54	54	54	54	54	53	54	52	53	55	52	52	52	52	52	53	55	54	52	52	50	50	50	50	50	48	48	48	48	52
November	48	47	46	48	48	48	48	50	48	48	48	49	49	48	44	41	40	37	37	37	41	45	45	45	45	39	37	37	43	42	-	44
December	37	39	42	42	40	38	39	36	36	36	35	38	--	38	37	37	37	37	37	37	37	37	37	37	37	37	37	37	--	37	37	38
Water temperatures (°F), calendar year 1959																																
January	37	37	34	34	36	34	35	32	--	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	36	36
February	35	36	36	36	35	35	37	37	37	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	34	-	-	-	36
March	35	35	35	35	35	35	35	35	37	37	37	37	37	36	36	36	36	36	36	36	41	41	41	41	41	42	43	46	46	45	46	35
April	46	46	46	46	46	48	48	48	46	46	43	43	48	50	50	50	48	50	46	50	47	48	50	50	50	48	48	46	46	46	-	49
May	50	50	52	54	54	54	54	52	54	54	50	50	50	52	52	55	55	55	52	52	52	52	53	53	58	57	55	50	51	51	52	53
June	54	60	63	65	64	64	57	57	57	57	54	57	56	56	62	62	60	60	60	62	63	64	64	64	64	64	64	62	60	61	-	61
July	61	64	64	66	64	64	66	63	63	64	66	70	73	72	73	73	72	72	72	73	73	73	73	74	73	74	75	75	72	69	69	70
August	72	72	70	70	70	70	70	70	68	70	70	68	67	66	64	64	64	64	64	64	64	64	63	63	--	65	65	63	63	63	63	66
September	63	61	61	61	64	62	60	62	62	62	63	61	61	62	63	64	63	61	61	57	57	57	57	59	59	57	57	57	54	54	-	60
October	52	52	51	51	51	52	50	50	50	48	48	48	48	48	48	48	48	54	52	54	52	52	52	52	52	52	52	52	52	50	48	51
November	48	48	48	46	46	44	43	43	46	48	46	35	32	39	39	37	37	39	39	39	39	41	43	43	43	43	43	41	40	40	-	42
December	40	43	43	44	43	43	43	43	43	43	43	43	43	41	41	41	38	41	41	41	41	41	41	41	41	41	40	40	40	38	37	41
Water temperatures (°F), calendar year 1960																																
January	--	--	35	35	35	35	35	--	37	39	39	39	39	39	39	39	39	39	39	41	41	39	37	37	37	39	39	39	39	39	39	38
February	39	39	39	34	36	39	39	39	39	39	39	39	39	39	41	41	41	41	41	41	41	40	39	39	39	39	33	32	--	-	-	39
March	--	--	--	--	34	34	34	34	34	34	40	39	39	39	39	39	39	39	39	39	39	39	43	44	45	45	45	--	45	45	45	40
April	45	40	40	40	46	46	50	50	54	52	52	52	52	52	52	48	--	50	50	53	53	53	43	46	43	43	46	46	46	49	-	48
May	48	48	48	48	48	48	50	50	50	52	55	59	59	57	57	52	--	54	55	54	50	50	50	48	48	48	50	50	57	57	59	52
June	59	59	59	61	59	59	61	61	61	60	61	61	62	65	65	65	63	55	54	--	--	54	54	54	63	63	66	64	66	66	-	61
July	66	70	70	70	68	68	68	72	73	65	73	73	73	73	73	72	72	72	74	73	73	72	73	73	73	73	73	73	73	72	73	74
August	73	73	70	70	68	70	70	70	70	70	71	71	71	75	--	75	72	70	70	73	73	73	73	73	63	61	63	63	63	63	63	69
September	63	64	66	66	66	66	60	63	61	59	60	62	64	64	66	64	63	63	63	63	63	59	59	53	53	55	56	56	57	57	-	61
October	59	59	59	59	59	59	59	--	57	57	57	55	55	53	54	54	54	54	52	52	52	54	51	51	51	51	51	50	52	51	48	54
November	48	46	47	47	48	48	50	--	48	46	44	44	43	48	45	46	46	46	45	45	45	45	45	45	45	44	42	40	40	40	-	45
December	40	40	36	37	36	36	36	34	34	33	33	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1961																																
January	33	33	34	34	34	34	34	34	34	34	34	34	34	33	33	33	34	35	34	35	35	35	35	34	34	33	34	34	32	32	32	34
February	32	32	32	33	33	32	32	32	32	32	39	39	39	37	39	36	36	35	35	36	36	36	36	37	37	35	34	34	-	-	-	35
March	34	34	32	36	34	36	36	36	36	36	37	38	38	38	39	44	43	43	43	44	44	43	43	43	41	41	41	41	41	41	41	39
April	41	41	42	42	44	44	44	46	46	44	44	45	45	43	43	44	45	45	45	47	47	46	46	45	45	45	45	45	48	45	-	45
May	48	52	52	54	56	53	49	48	48	52	51	52	52	53	53	54	55	52	53	48	52	54	59	61	63	63	64	64	65	65	66	55
June	64	64	58	61	63	62	63	63	63	62	62	64	64	64	64	66	68	72	72	72	72	72	72	72	72	72	72	72	70	70	-	67
July	64	64	65	66	68	68	68	--	--	--	--	--	69	--	69	68	70	70	70	72	72	72	72	72	72	72	72	72	68	68	68	69
August	69	69	69	69	70	72	72	72	71	68	66	69	64	68	68	68	68	68	74	76	75	72	75	72	73	68	68	68	68	68	67	70
September	67	60	58	56	57	57	59	61	61	59	58	57	54	54	54	54	54	56	56	54	54	54	50	50	49	49	48	49	48	49	-	55
October	47	47	46	48	49	50	52	52	52	52	48	48	50	50	50	50	56	56	61	59	48	48	40	38	39	39	42	41	41	41	39	48
November	39	39	37	37	37	37	35	37	37	39	46	43	43	41	39	39	--	35	35	35	35	34	34	34	34	33	33	34	33	33	-	37
December	33	34	35	35	--	--	35	34	32	32	32	32	32	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	--	--	33
Water temperatures (°F), calendar year 1962																																
January	--	--	34	35	34	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	35	35	33
February	36	--	34	33	32	32	32	32	32	32	32	32	33	33	35	35	34	34	34	34	32	32	32	32	32	32	32	32	-	-	-	33
March	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	35	35	35	35	35	34	34	35	35	35	35	35	36	36	38	33
April	39	39	39	39	39	42	45	44	44	43	43	43	44	43	46	46	48	50	50	51	52	51	52	52	52	52	53	52	52	48	-	46
May	48	48	48	47	53	53	53	54	54	54	53	54	54	53	53	53	52	51	51	52	52	52	52	52	53	52	50	50	52	52	55	54
June	57	57	57	57	57	58	58	56	57	57	57	59	59	59	56	56	56	57	57	58	59	60	62	64	--	68	68	68	68	68	-	60
July	75	74	68	68	69	69	69	72	72	72	73	73	72	72	68	68	70	--	70	70	70	70	70	70	--	72	72	72	72	--	70	71
August	--	72	--	73	73	70	70	--	72	72	72	--	73	73	72	--	71	68	66	64	64	66	64	63	64	64	64	64	64	63	62	68
September	57	59	59	57	55	57	59	55	53	53	53	53	53	53	53	54	55	57	54	55	59	59	59	57	57	57	59	59	5	56	-	56
October	54	54	55	55	55	53	53	--	-	50	50	52	50	50	50	50	50	50	50	50	50	50	50	--	--	--	49	48	49	49	51	
November	49	48	48	48	48	48	46	46	-	-	--	45	45	45	43	45	42	41	41	41	41	40	39	37	37	37	37	37	39	39	-	43
December	39	39	39	38	38	38	-	-	-	-	37	37	36	37	37	37	37	39	39	39	39	37	36	32	32	32	32	32	32	32	32	36
Water temperatures (°F), calendar year 1963																																
January	3	32	32	32	32	32	32	32	32	32	32	--	36	36	36	34	34	34	32	32	32	32	32	32	32	--	32	32	32	32	32	33
February	32	32	32	32	32	32	32	32	32	32	33	33	33	33	33	32	32	33	33	33	33	32	32	32	32	33	33	--	-	-	-	32
March	33	37	37	36	35	34	36	36	36	34	34	35	35	35	35	35	35	37	37	36	37	37	39	39	--	42	42	42	42	43	43	37
April	43	43	40	41	42	36	39	33	41	40	41	41	41	42	42	40	42	39	40	--	37	37	37	37	37	37	52	52	52	52	-	41
May	52	52	50	50	50	52	52	52	52	52	52	51	51	52	52	52	52	52	57	57	--	52	57	58	59	59	59	59	59	59	59	54
June	60	61	59	59	59	59	59	57	59	59	57	59	60	61	63	--	63	64	66	65	64	64	64	64	62	62	62	62	64	60	-	61
July	61	61	61	--	64	65	65	67	68	67	68	67	65	65	64	64	69	66	66	65	65	66	66	67	66	65	66	70	70	71	72	66
August	72	72	68	68	68	69	69	71	72	73	73	73	73	73	73	73	73	73	70	70	70	68	66	65	65	63	63	--	71	68	67	70
September	--	67	67	67	67	68	68	68	68	68	68	68	68	66	65	60	60	58	58	58	59	59	59	58	58	58	58	58	57	56	-	63
October	56	56	56	56	56	--	57	57	57	55	55	57	57	57	57	57	57	57	57	57	57	57	57	56	56	46	42	42	42	44	43	54
November	43	46	--	46	--	45	--	45	45	43	45	43	43	43	45	44	44	41	41	39	36	36	36	36	36	36	36	39	39	39	-	41
December	39	37	37	37	37	37	37	37	35	34	33	33	32	34	34	33	33	33	34	34	34	34	34	35	35	34	34	--	35	35	35	35

86. Missouri River at Ryan Dam, near Black Eagle, Mont.

Water temperatures (°F). January and February 1964

Month	Day 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
January.....	35	35	35	35	35	35	35	35	34	34	33	33	34	34	30	34	35	35	35	35	35	34	34	34	33	33	33	34	34	34	34	34
February.....	35	34	34	34	34	34	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	34	34	34	34	34	34	34	-	-	34

Summary of once-daily temperature readings

		Jan		Feb		Mar		Apr		May		June		July		Aug		Sept		Oct		Nov		Dec	
1917	Max Min	--	--	--	32	33	32	44	32	54	35	63	46	74	61	70	62	63	53	57	36	45	36	37	32
1918	Max Min	34	32	35	32	43	32	49	36	57	43	68	52	70	61	70	61	64	56	59	48	48	35	39	32
1919	Max Min	36	34	34	32	42	32	55	41	65	49	73	55	75	68	70	64	65	46	50	35	38	33	37	33
1920	Max Min	37	33	37	34	42	33	46	36	54	42	66	53	75	62	75	61	66	52	56	40	43	40	38	34
1921	Max Min	37	34	38	33	41	32	49	40	58	46	70	54	72	61	--	--	64	48	53	47	60	32	43	32
1922	Max Min	37	32	35	32	35	32	46	35	57	44	72	55	72	61	75	68	68	56	59	48	46	38	36	32
1923	Max Min	35	32	33	32	35	32	50	33	58	46	64	55	76	63	72	66	70	57	56	38	44	32	37	33
1924	Max Min	36	32	39	33	40	37	47	40	57	48	67	51	--	--	--	--	--	--	--	--	--	--	--	--
1925	Max Min	36	33	--	--	--	--	53	44	61	47	70	53	75	66	75	57	68	50	52	36	41	36	39	34
1926	Max Min	--	--	40	35	--	--	--	--	--	--	72	59	--	--	--	--	64	44	53	48	48	35	--	--
1927	Max Min	36	32	35	32	43	33	53	40	55	44	66	50	70	62	70	64	64	53	57	46	46	35	39	33
1928	Max Min	36	33	37	33	46	35	50	39	61	48	65	55	75	62	70	58	68	52	55	45	45	37	--	--
1929	Max Min	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1930	Max Min	36	33	37	35	43	34	54	43	64	53	69	58	76	68	76	56	66	53	58	36	50	36	39	32
1931	Max Min	39	34	40	36	48	35	56	36	64	50	70	59	75	61	71	63	68	50	57	41	49	34	39	35
1932	Max Min	39	34	43	34	--	--	59	--	64	46	71	59	71	--	74	--	68	--	--	40	--	--	46	--
1933	Max Min	45	--	45	--	50	36	58	--	--	47	70	--	75	64	71	54	65	50	58	43	49	35	38	34
1934	Max Min	37	34	45	34	50	36	54	36	68	54	68	53	75	67	72	61	64	43	62	46	52	39	40	34
1935	Max Min	37	33	41	35	42	35	53	37	61	48	68	57	77	64	72	64	64	54	59	36	41	35	39	35
1936	Max Min	37	35	37	33	43	35	56	35	71	53	76	57	81	69	75	66	68	55	58	46	46	36	39	35
1937	Max Min	36	34	37	35	43	36	55	42	66	54	75	57	77	70	72	63	68	54	57	50	53	39	39	35
1938	Max Min	39	34	39	35	46	34	55	37	61	49	68	54	75	65	72	64	72	62	64	48	52	36	40	35
1939	Max Min	37	35	37	35	46	36	59	39	66	53	75	57	75	66	75	61	68	54	57	45	49	39	45	34
1940	Max Min	37	35	38	35	46	37	53	41	68	52	72	59	77	68	75	68	72	61	63	50	52	36	41	36
1941	Max Min	39	36	40	36	47	37	57	45	64	54	74	63	79	65	78	61	66	52	56	46	48	38	46	37
1942	Max Min	39	36	39	36	44	37	54	42	62	51	65	56	76	66	76	55	69	58	62	45	47	39	39	37
1943	Max Min	40	33	39	36	42	36	53	42	62	48	65	51	75	60	75	67	68	59	63	47	50	41	46	34
1944	Max Min	39	35	39	35	44	35	54	46	68	51	66	55	74	66	72	64	71	56	59	54	54	42	44	35
1945	Max Min	39	37	39	33	50	33	51	41	61	51	66	52	73	60	75	66	67	50	59	45	48	35	37	33
1946	Max Min	35	32	37	30	47	39	57	45	64	50	68	54	73	60	72	64	66	51	57	38	46	35	40	34
1947	Max Min	39	36	39	35	46	35	57	41	60	52	64	58	75	64	72	52	68	50	59	50	52	38	41	36
1948	Max Min	39	34	39	35	42	35	50	41	67	48	66	59	71	66	74	65	68	54	59	48	50	37	38	34
1949	Max Min	36	34	37	34	42	36	54	43	64	52	68	57	75	60	75	66	69	54	61	40	48	42	42	34
1950	Max Min	38	34	39	36	44	36	51	43	59	44	67	49	73	63	71	63	71	52	57	48	48	37	41	35

86. Missouri River at Ryan Dam, near Black Eagle, Mont.
Summary of once-daily temperature readings--Continued

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1951	Max	--	39	38	53	58	64	74	74	66	57	44	41
	Min	--	36	32	35	45	41	59	57	50	41	37	33
1952	Max	37	37	37	55	60	64	71	75	66	61	48	37
	Min	34	34	34	36	51	57	63	67	59	50	37	34
1953	Max	39	38	45	51	57	63	75	74	67	57	54	43
	Min	34	35	34	40	48	50	62	65	56	48	41	36
1954	Max	39	43	46	50	63	66	74	70	64	54	50	44
	Min	33	37	35	35	43	53	62	64	54	46	38	35
1955	Max	39	39	39	50	59	70	75	72	70	55	48	39
	Min	34	34	35	37	48	57	60	64	50	46	36	32
1956	Max	39	39	46	49	57	68	75	69	64	57	50	42
	Min	34	34	32	46	46	54	66	64	55	39	37	35
1957	Max	40	37	40	50	70	64	75	70	68	60	46	41
	Min	33	34	35	40	48	54	63	57	49	44	35	34
1958	Max	39	36	49	49	66	65	72	75	70	55	50	42
	Min	34	34	33	43	51	53	60	63	54	48	37	35
1959	Max	37	37	46	50	58	64	75	72	64	54	48	44
	Min	32	34	35	43	50	54	61	63	54	48	32	37
1960	Max	41	41	45	54	59	66	74	75	66	59	50	40
	Min	35	32	34	40	48	54	65	61	53	48	40	33
1961	Max	35	39	44	48	66	72	72	76	67	61	46	35
	Min	32	32	32	41	48	58	64	64	48	38	33	32
1962	Max	35	36	38	53	55	68	75	73	59	55	49	39
	Min	32	32	32	39	47	56	68	62	53	48	37	32
1963	Max	36	33	43	52	59	65	72	73	68	57	46	39
	Min	32	32	33	33	50	57	61	63	56	42	36	32
1964	Max	35	35	--	--	--	--	--	--	--	--	--	--
	Min	30	33	--	--	--	--	--	--	--	--	--	--

Extremes for years 1917-28, 1930-64

	Max	45	45	50	59	71	76	81	78	72	64	60	46
	Min	30	30	32	32	35	41	59	52	43	35	32	32

87. Belt Creek near Monarch, Mont. (6-0905)

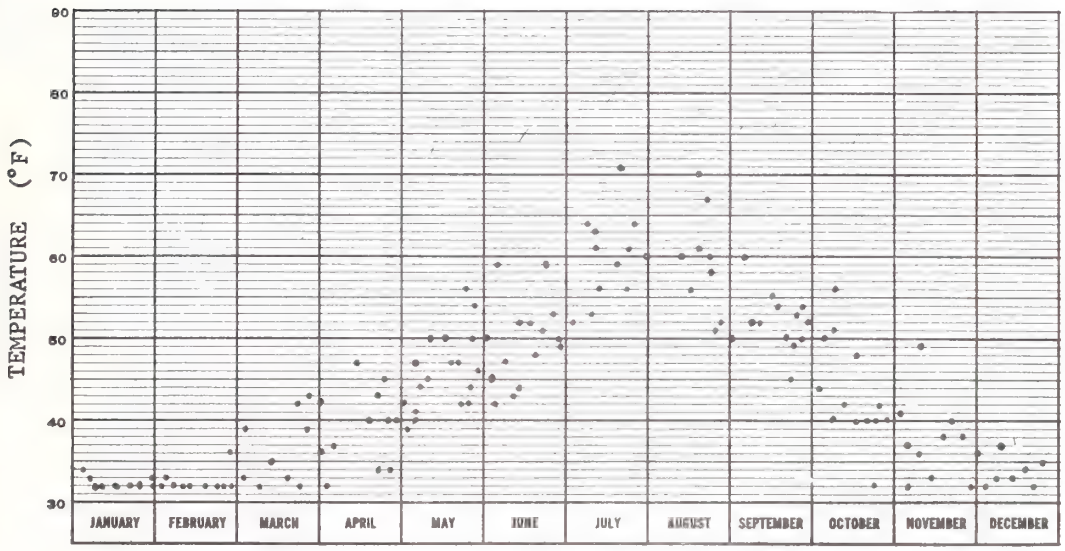
Location.--At gaging station, lat 47°12', long 110°56', in SE¼NW¼ sec.26, T.17 N., R.6 E., on left bank half a mile south of Riceville and 9 miles northwest of Monarch. Altitude of gage is 3,960 ft (by barometer).

Drainage area.--368 sq mi.

Water temperature records available.--141 spot observations made at time of discharge measurements during period May 1951 to December 1965.

Extremes.--Discharge 1951-65: Maximum, 11,000 cfs June 4, 1953; no flow Feb. 21, Dec. 24, 1962. Flood in 1908 was several feet lower than in 1953.

Water temperatures 1951-65: Maximum observed, 71°F July 21, 1959; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-65

87. Belt Creek near Monarch, Mont. (6-0905)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
31-52	0830	32	21-52	1030	32	20-52	1500	33	5-52	0800	37	2-51	1110	39	19-51	1655	51
21-53	0930	32	27-53	1500	32	8-55	1630	32	17-52	0830	47	18-51	1330	47	12-52	1000	52
12-54	1400	32	5-54	1600	32	29-57	1100	39	2-53	1000	32	29-51	0750	39	8-54	1830	43
7-55	1000	32	9-55	1230	32	14-58	1330	35	25-55	1500	34	7-52	1800	46	14-55	1900	52
4-61	1440	34	27-56	1430	32	26-59	1500	42	21-58	1400	40	26-53	1400	50	5-57	1600	59
31-61	1525	33	28-61	1550	36	26-62	0800	32	1-60	1300	36	19-54	1700	47	2-60	1200	45
24-62	1500	32	26-62	1550	32	2-63	1315	39	27-61	1420	40	23-55	1830	42	21-61	1130	59
5-63	1000	33	8-63	1600	32	29-63	1505	43	26-62	2000	45	8-56	1600	50	23-62	1135	50
8-64	1530	32	2-64	1530	32	2-64	0930	33	23-63	1200	43	25-56	1300	56	7-63	1405	47
12-65	1625	32	3-65	1600	33				1-64	0845	42	7-57	1800	45	1-64	1800	50
			28-65	1620	32				27-64	2000	34	14-58	1530	50	9-64	2015	44
									29-65	0920	40	1-59	1230	42	17-64	1915	48
												5-60	1145	40	27-64	0930	49
												27-61	1630	54	3-65	0855	42
												25-62	1230	44	22-65	1615	53
												21-63	1055	42			
												28-63	1230	46			
												6-64	1950	44			
July			August			September			October			November			December		
13-51	1030	53	16-51	1000	60	20-51	0930	45	18-51	0800	32	15-51	1000	33	20-51	1530	32
15-52	1700	63	21-52	1730	61	25-52	1030	50	16-52	0820	40	20-52	0835	38	17-52	1000	34
15-54	1000	61	17-54	1745	56	9-53	0900	52	7-53	0830	56	12-53	1500	49	1-53	1430	36
20-55	1530	59	22-55	1700	60	13-54	1900	55	29-54	1700	40	29-56	1530	38	3-54	1600	32
21-59	1730	71	22-56	1415	67	21-56	1930	49	3-55	1500	50	5-59	1430	32	12-59	1330	37
14-60	1525	64	21-58	1000	70	26-57	1300	54	26-56	1030	42	2-60	1310	41	22-61	1055	35
26-61	1000	61	26-60	1225	52	18-58	1430	50	15-57	1600	48	30-60	1440	32	11-62	1400	33
31-62	1300	60	22-63	1430	58	17-59	1400	54	15-58	1430	40	6-63	1000	37	3-63	1300	32
2-63	0905	52	24-65	0725	51	28-60	1510	52	18-61	0930	40	24-64	1425	40	7-65	1010	33
25-63	0840	56				5-61	1720	60	6-62	1630	40	10-65	1025	36			
29-64	1725	64				11-62	1330	52	6-63	1300	51						
15-65	1230	56				1-64	1330	50	10-64	1520	42						
						24-64	1400	53	2-65	0910	44						

BELT CREEK BASIN

88. Belt Creek at Belt, Mont.

Location.--At thermograph site, lat 47°23'00", long 110°55'50", in NW¼ sec.26, T.19 N., R.6 E., on left bank at Belt. Altitude of gage is 3,550 ft (from topographic map).

Water temperature records available.--Thermograph record during period June to July 1962 published in this report.

Extremes.--Water temperatures 1962: Maximum recorded, 73°F July 23, 1962; minimum recorded, 51°F June 23, 1962; probably goes to freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.

Water temperatures (°F), June to July 1962

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
June																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	60	60	65	67	67	65	65	67	--	-	
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	51	53	56	56	55	53	53	--	-	
July																																
Maximum.....	--	--	--	--	--	71	65	69	69	69	69	70	58	65	66	67	71	62	65	65	68	72	73	--	--	--	--	--	--	--	--	
Minimum.....	--	--	--	--	--	--	55	54	57	57	56	56	56	54	54	53	55	56	--	52	53	57	58	--	--	--	--	--	--	--	--	

89. Missouri River at Fort Benton, Mont. (6-0908)

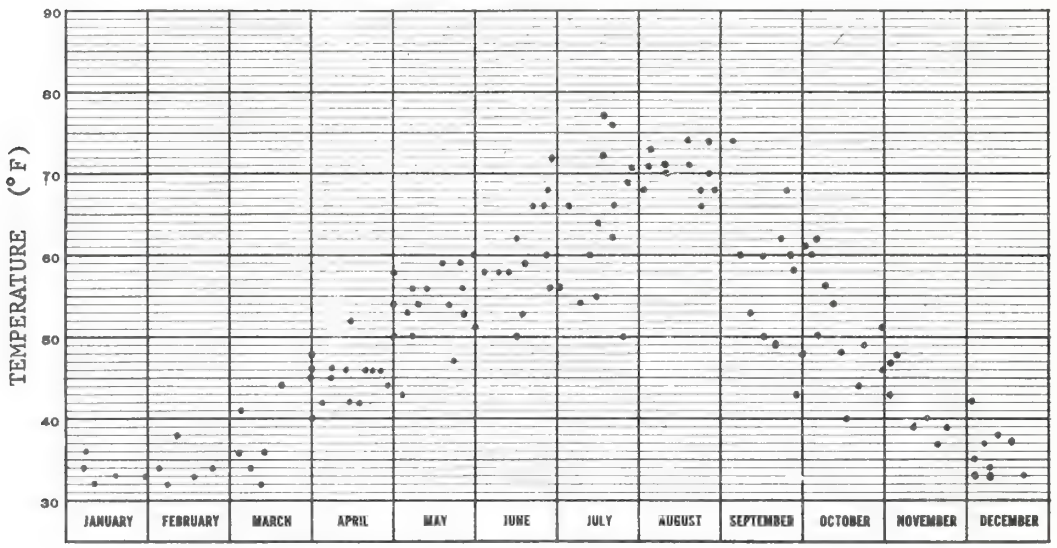
Location.--At gaging station, lat 47°49'03", long 110°39'59", in SW¼SW¼ sec.23, T.24 N., R.8 E., on left bank at downstream side of abandoned highway bridge at Fort Benton, 4 miles upstream from Shonkin Creek, and at mile 2,073.2. Datum of gage is 2,614.05 ft above mean sea level, datum of 1929.

Drainage area.--24,749 sq mi.

Water temperature records available.--129 spot observations made at time of discharge measurements during period June 1949 to December 1965.

Extremes.--Discharge 1890-1965: Maximum observed, about 140,000 cfs June 6, 1908; minimum daily, 627 cfs July 5, 1936.

Water temperatures 1949-65: Maximum observed, 77°F July 15, 1949; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

89. Missouri River at Fort Benton, Mont. (6-0908)
Water temperatures at time of discharge measurements

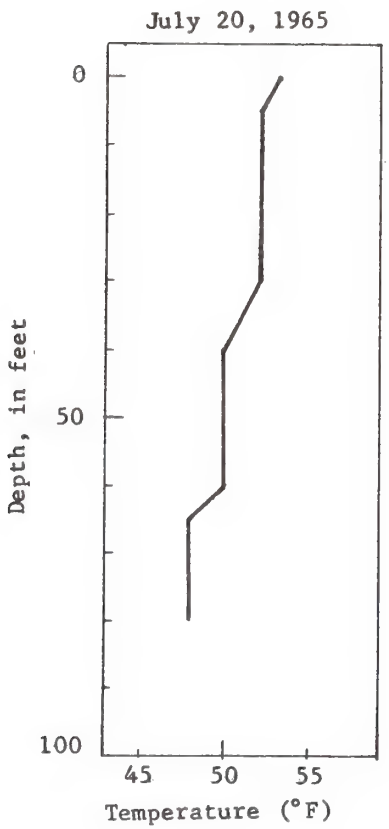
Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
15-51	1300	33	17-55	1330	33	10-55	1200	32	4-51	1330	46	9-51	1410	56	3-49	1500	58
8-60	1700	32	6-60	1100	38	25-59	1030	44	16-52	1030	46	7-52	1010	54	24-49	1930	68
7-61	1130	34	3-61	1000	34	3-61	1000	36	1-53	1000	40	25-55	1030	47	10-51	1130	58
7-63	1430	36	4-62	1800	32	31-61	0900	45	28-53	1020	46	28-56	1900	59	11-52	1100	62
31-64	0730	33	26-64	1630	34	3-63	1440	41	27-55	1000	46	1-57	1520	58	15-55	1205	66
						31-63	1100	46	16-56	1600	52	25-57	0925	54	18-58	1530	66
						10-64	1315	36	4-58	1430	45	1-58	1000	50	7-60	1200	58
						31-64	1200	48	12-61	1700	48	1-59	1530	54	26-61	1500	72
						5-65	1000	34	25-61	1800	42	4-60	1230	50	10-63	2115	58
									26-61	0900	46	31-61	1925	60	11-64	1225	50
									3-62	1330	42	6-62	1805	56	12-64	1830	53
									30-65	1730	43	31-62	0930	51	25-64	1700	56
												3-63	1540	53	13-65	1140	59
												24-63	0910	59	23-65	1200	60
												2-64	1830	43			
												28-64	1650	53			
												28-65	1630	56			
July			August			September			October			November			December		
15-49	1230	77	2-50	1100	71	5-50	1415	74	17-51	1100	40	14-51	1100	39	18-52	1800	33
12-51	0900	60	20-52	1030	68	19-51	1100	62	15-52	1100	48	19-52	0900	40	10-53	1600	37
16-52	1000	66	19-54	1145	74	24-52	1130	68	4-55	1015	50	21-56	1030	37	2-54	1000	35
9-53	0800	54	24-55	1200	70	10-53	1730	53	2-56	1600	60	2-61	1330	43	3-59	1100	37
16-54	1330	62	24-56	1430	74	29-53	0930	43	25-56	1800	44	4-62	1315	48	2-60	1030	33
15-55	1205	72	9-57	0930	70	15-54	1445	60	1-57	1500	61	3-63	1045	47	6-61	1000	38
27-56	0930	69	19-58	1930	71	25-59	1130	60	31-57	1000	46	23-64	1500	39	2-62	1230	42
5-57	0900	66	20-60	1200	66	26-60	1700	58	14-58	1430	54				4-63	1405	34
14-58	1930	64	2-61	1530	73	6-62	1830	60	31-59	1230	46				4-64	1325	33
16-59	1730	76	9-62	1750	70	15-65	1615	50	7-62	1545	56						
1-63	0625	56	1-63	1910	68	17-65	1200	49	3-63	1320	62						
28-64	1250	71	25-65	1700	68				31-64	1630	51						
14-65	1300	55							1-65	1000	48						
26-65	1630	50							26-65	1300	49						

90. Two Medicine Lake near East Glacier, Mont.

Location.--Lat 48°28', long 113°24', in E½ sec.5, T.31 N., R.14 W., (unsurveyed), 2 miles southwest of old Two Medicine Chalet, 8 miles northwest of East Glacier. Altitude of lake is 5,156 ft (from topographic map).

Water temperature records available.--One vertical profile taken on July 20, 1965.

Cooperation.--Records furnished by the National Park Service, Glacier National Park.



Depth, in feet	Temp. in Degrees F
Surface	53
5	52
10	52
15	52
20	52
25	52
30	52
35	51
40	50
45	50
50	50
55	50
60	50
65	48
70	48
75	48
80	48

91. Two Medicine River near Browning, Mont. (6-0920)

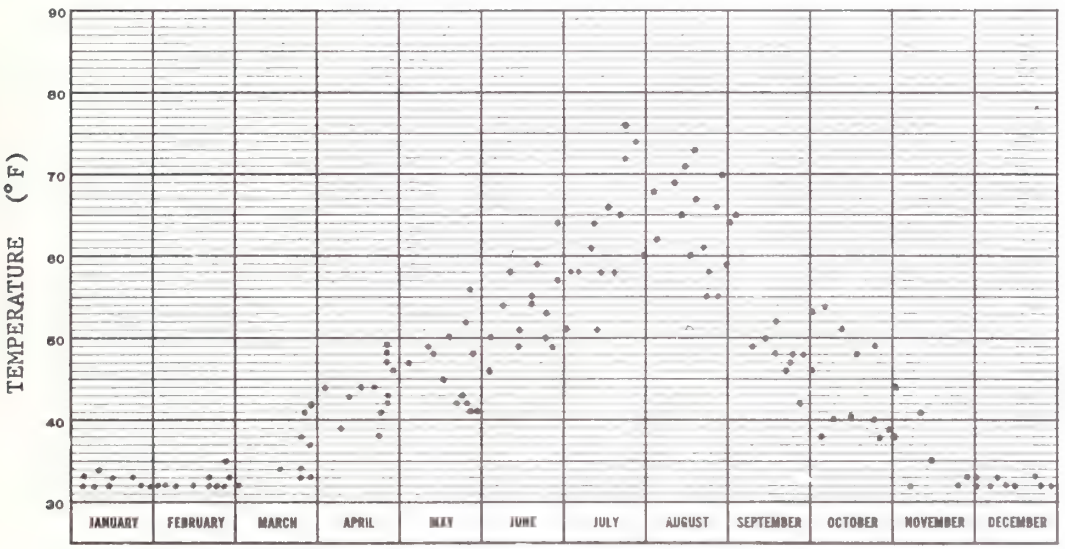
Location.--At gaging station, lat 48°28'30", long 112°48'10", in SE¼ sec.5, T.31 N., R.9 W., on right bank 800 ft upstream from new bridge on U. S. Highway 89, 11 miles southeast of Browning, and 15 miles upstream from Badger Creek. Altitude of gage is 3,930 ft (from topographic map).

Drainage area.--317 sq mi.

Water temperature records available.--143 spot observations made at time of discharge measurements during period May 1951 to December 1965. Once-daily observations made during period October 1955 to September 1956 (incomplete) published in reports of the Geological Survey.

Extremes.--Discharge 1907-24, 1951-65: Maximum, 100,000 cfs June 8, 1964; minimum, 2.0 cfs Aug. 27, 1964.

Water temperatures 1951-65: Maximum observed, 76°F July 21, 1956; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-65

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1955	Max	--	--	--	--	--	--	--	--	--	48	--	35
	Min	--	--	--	--	--	--	--	--	--	33	32	32
1956	Max	33	36	36	50	49	--	76	68	--	--	--	--
	Min	32	32	32	32	34	--	48	61	--	--	--	--

91. Two Medicine River near Browning, Mont. (6-0920)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-52	1600	32	26-53	1630	32	18-52	1200	34	14-52	1540	44	24-51	0800	43	20-52	0720	53
6-54	1000	34	2-54	1830	32	1-55	1700	32	7-53	1525	39	14-52	1330	49	11-54	1100	49
5-60	1430	32	1-55	1130	32	28-59	1430	41	29-55	1200	42	21-54	0930	45	17-55	1855	55
4-61	1430	33	2-60	1330	32	1-60	1700	32	19-56	1545	44	27-55	1000	41	19-56	1700	59
30-61	1430	32	27-61	1430	32	28-61	1500	38	29-57	1915	49	24-56	0830	42	13-57	1400	47
30-62	1410	32	24-62	1300	32	28-62	1200	34	2-58	1830	44	25-56	1100	43	17-58	1130	54
4-63	1330	32	6-63	1035	32	29-63	1300	42	29-59	1630	43	23-57	1630	50	3-59	1200	46
31-63	0815	32	28-63	1235	35	28-64	1510	33	29-60	1430	48	15-58	1200	48	3-60	1230	50
28-64	1630	33	16-64	1030	32	29-65	1720	33	28-61	1600	41	27-58	1300	56	10-60	1800	58
12-65	1115	33	29-64	1500	33				30-63	1330	46	26-61	1730	42	28-61	1500	64
28-65	1445	33	24-65	1645	33				9-64	1220	43	3-62	1345	47	7-63	1745	54
									29-64	1330	47	29-62	0800	48	28-63	1245	57
									27-65	1530	38	26-63	1610	52	11-64	1640	51
												30-64	1830	41	20-64	1330	50
												25-65	1050	43	25-65	1615	49
July			August			September			October			November			December		
10-51	1800	51	15-51	1355	65	13-51	1000	50	9-51	1650	51	6-51	1420	32	12-51	1400	32
30-52	1520	74	23-54	1630	61	10-52	1240	49	15-52	0935	40	19-52	1100	35	10-52	1200	32
1-53	1600	51	29-55	1800	66	1-53	1700	64	1-53	1000	46	10-53	1700	41	8-53	1330	33
20-54	1800	58	21-56	1900	67	2-54	1400	65	6-55	1150	40	1-57	1330	38	1-54	0930	32
12-55	1720	64	7-57	1800	62	18-54	1430	52	3-57	1400	38	29-60	1700	32	30-54	1600	32
24-56	1830	72	21-58	1600	73	27-56	1000	48	16-58	1600	48	1-62	1300	44	6-59	1030	32
3-57	1200	58	17-60	1100	60	18-58	1100	48	29-59	1530	38	30-62	0930	33	27-63	1500	33
18-58	1130	66	13-61	1030	69	23-59	1530	46	31-61	1700	39	30-65	1400	33	1-64	1640	33
15-59	0930	58	30-61	1530	70	27-61	1500	47	3-62	1615	54				28-65	1250	32
9-60	1030	61	3-62	1735	68	30-64	1620	48	1-63	1000	53						
2-62	1800	58	31-62	1230	59	29-65	1200	42	31-63	1330	39						
31-63	1115	60	28-63	0900	58				28-64	1415	40						
22-64	1915	65	18-64	1345	71				28-65	1530	49						
			30-64	1400	55												
			28-65	1400	55												

92. Badger Creek near Browning, Mont. (6-0925)

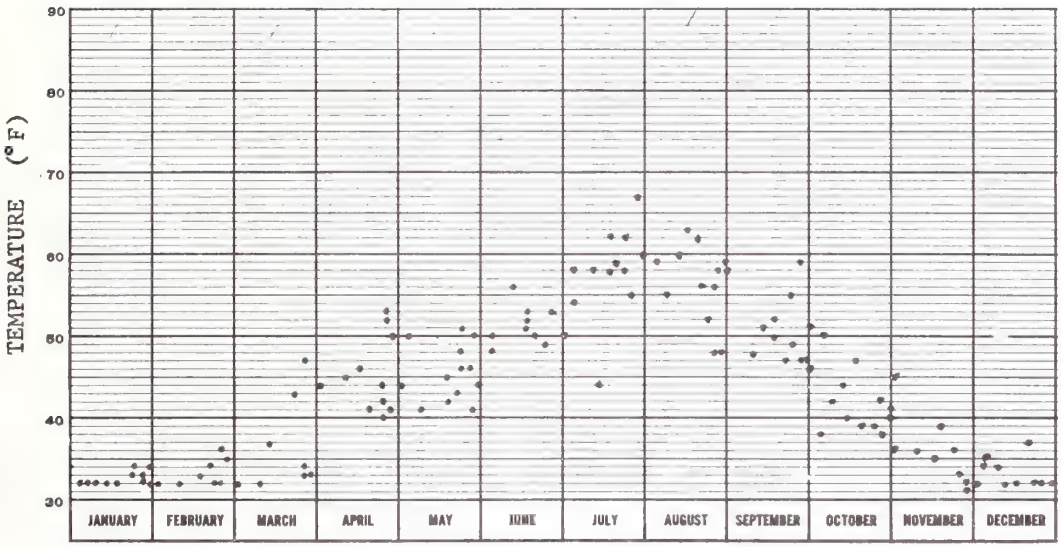
Location.--At gaging station, lat 48°21'00", long 112°50'20", in NE¼ sec.24, T.30 N., R.10 W., on right bank just upstream from point of diversion to Four Horns Canal, 15 miles upstream from mouth, and 17 miles southeast of Browning. Datum of gage is 4,179.26 ft above mean sea level (Bureau of Reclamation bench mark).

Drainage area.--133 sq mi.

Water temperature records available.--133 spot observations made at time of discharge measurements during period May 1951 to December 1965.

Extremes.--Discharge 1951-65: Maximum, 49,700 cfs June 8, 1964; minimum daily, 25 cfs Dec. 11-15, 1963.

Water temperatures 1951-65: Maximum observed, 67°F July 30, 1952; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-65

92. Bedger Creek near Browning, Mont. (6-0925)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
11-52	1200	32	14-52	1730	32	18-52	1500	37	14-52	1200	45	23-51	1615	48	12-51	1450	56
6-54	1130	32	26-53	1800	32	14-56	1530	32	29-55	1400	41	14-52	0900	41	19-52	1630	53
31-55	1700	32	2-60	1700	32	27-59	1610	43	19-56	1900	46	27-55	1200	41	20-55	1345	50
31-58	1630	34	27-61	1130	32	1-60	1330	32	29-57	1500	52	23-56	1600	45	19-56	1200	51
30-59	1730	32	21-62	1700	33	28-61	1030	34	2-58	1700	44	23-57	1115	42	2-59	1500	50
5-60	1730	32	28-63	1515	36	28-63	1655	47	28-58	1830	44	26-58	1930	51	2-60	1800	48
4-61	1100	32	29-64	1555	35	28-64	1105	33	28-59	1700	40	1-60	1100	44	28-63	1530	53
30-61	1130	32	24-65	1600	34	29-65	1700	33	28-61	1200	42	26-61	1250	46	19-64	1830	52
30-62	1120	33							30-63	1730	50	3-62	1515	50	26-65	1300	49
4-63	0920	32							29-64	1530	53	29-62	1700	50			
31-63	1325	32							25-65	1300	41	27-63	1345	46			
27-64	1520	34										31-64	1500	44			
16-65	1500	32										24-65	1800	43			
27-65	1700	33															
July			August			September			October			November			December		
11-51	1005	44	23-54	1830	56	13-51	1340	51	10-51	1000	44	7-51	0820	36	12-51	1100	32
30-52	1710	67	29-55	1600	58	10-52	1900	48	15-52	1215	40	19-52	1230	35	10-52	1030	32
1-53	1345	50	21-56	1600	62	1-53	1500	58	1-53	1200	46	1-57	1600	36	1-54	1130	32
21-54	1200	55	7-57	1500	55	18-54	1630	52	20-54	1230	39	21-58	1330	39	29-54	1500	32
12-55	1620	58	28-57	1230	56	26-56	1600	55	6-55	1400	42	29-60	1500	33	21-58	1400	37
24-56	1400	62	17-60	1530	63	18-58	1400	50	3-57	1630	38	28-61	1400	36	6-59	1230	34
2-57	1800	58	13-61	1200	60	23-59	1200	47	16-58	1800	47	1-62	1615	45	2-63	1700	35
18-58	1400	62	3-62	1930	59	29-60	1200	59	29-59	1330	38	30-62	1300	32	27-63	1230	32
14-59	1600	59	31-62	1600	59	27-61	1030	49	31-61	1530	41	30-65	1500	33	2-64	1000	34
9-60	1330	58	28-63	1000	52	30-64	1300	47	3-62	1220	59				28-65	1500	32
12-61	1130	58	28-64	1400	48	29-65	1400	47	1-63	1330	51						
2-62	1500	54	29-65	1200	48				31-63	1530	40						
31-63	1410	60							28-64	1100	39						
16-64	2130	58							29-65	1300	42						

93. Cut Bank Creek at Cut Bank, Mont. (6-0990)

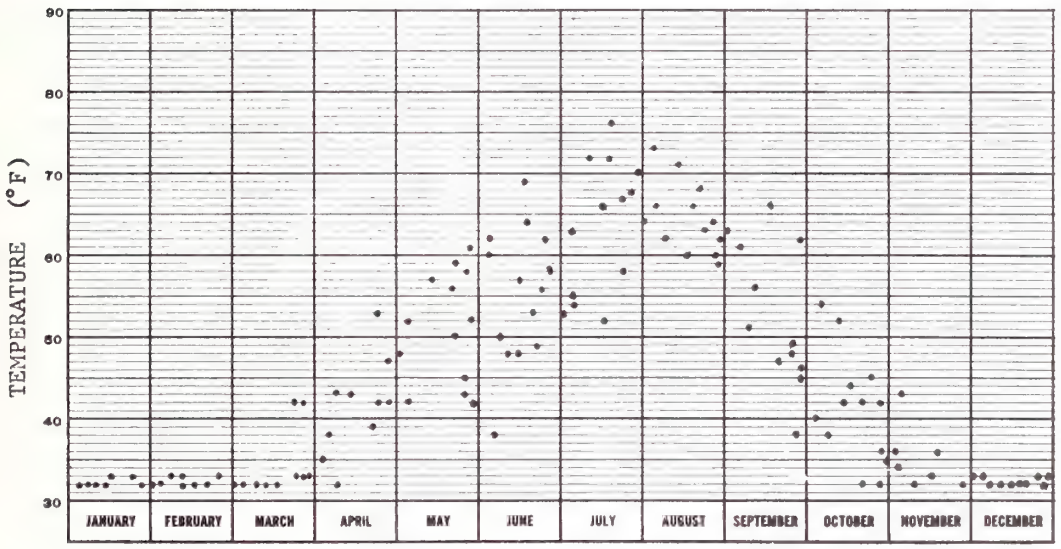
Location.--At gaging station, lat 48°38'00", long 112°20'40", in SE¼NE¼ sec.11, T.33 N., R.6 W., on right bank at highway bridge half a mile west of Cut Bank and 17 miles upstream from confluence with Two Medicine River. Altitude of gage is 3,550 ft (from topographic map).

Drainage area.--1,065 sq mi.

Water temperature records available.--142 spot observations made at time of discharge measurements made during period November 1950 to December 1965 including 12 observations made at time of water quality sampling.

Extremes.--Discharge 1905-20, 1922-24, 1951-65: Maximum, 16,600 cfs June 9, 1964; minimum observed, 4 cfs Dec. 1, 1905.

Water temperatures 1950-65: Maximum observed, 76°F July 17, 1958; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-65

93. Cut Bank Creek at Cut Bank, Mont. (6-0990)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-51	0915	32	7-51	1645	32	7-51	0915	32	3-51	1930	35	3-51	0705	42	6-51	0730	38
10-52	1100	32	14-52	1100	32	18-52	0930	32	9-52	0930	32	24-51	1445	56	12-51	0800	57
6-54	1430	32	26-53	1400	32	2-55	1400	32	7-53	1825	38	14-52	1540	57	18-52	0730	53
5-55	1000	32	1-55	1400	32	10-60	1130	32	19-56	0930	43	26-55	1800	45	17-55	1435	64
5-60	1100	32	2-60	1000	32	28-61	1700	42	30-59	1000	47	24-57	0905	50	17-58	1600	69
4-61	1700	32	27-61	1730	32	28-62	0930	33	30-60	0900	42	28-58	0930	61	3-59	1730	60
30-61	1730	32	1-62	1040	32	1-63	0845	32	28-61	1830	42	27-61	1100	58	3-60	1800	62
4-63	1730	32	1-63	1230	32	29-63	1715	42	9-64	1500	43	3-62	1205	52	28-61	1000	62
29-64	0710	33	6-63	1620	33	29-64	0900	33	28-64	1750	53	30-62	1000	52	8-63	0800	50
11-65	1300	33	7-63	1320	33	30-65	1240	33	27-65	1030	39	1-63	1020	48	28-63	0800	58
29-65	0800	33	28-64	0900	33							25-63	1630	59	9-64	1400	48
												30-64	1230	42	10-64	1015	48
												26-65	0915	43	20-64	1900	49
															25-65	1040	56
July			August			September			October			November			December		
3-51	0530	54	1-51	0705	64	6-51	1500	61	9-51	1410	52	2-50	0820	34	8-50	0815	32
10-51	1300	52	15-51	0805	60	11-51	1620	56	14-52	1650	42	6-51	1230	32	12-51	1700	32
30-52	1315	70	3-55	1535	73	10-52	0905	51	19-54	1700	42	10-52	1000	33	10-52	1600	32
1-53	1820	53	26-55	1345	64	1-53	1900	63	6-55	0935	38	11-53	0900	36	3-53	1630	32
20-54	1200	58	22-56	1000	63	30-53	1800	45	27-56	1030	32	30-53	1630	32	5-59	1730	32
13-55	1055	66	8-57	0930	62	27-56	1300	48	3-57	1030	40	1-57	1000	36	2-63	1035	33
25-56	0900	68	28-57	1900	60	17-58	1200	66	16-58	1200	44	30-60	1000	32	27-63	0900	33
3-57	1500	63	21-58	1130	68	24-59	0930	47	30-59	0930	32	2-62	1110	43	1-64	1230	33
17-58	1800	76	16-60	1930	66	27-61	1630	49	4-62	1630	54	30-62	1830	32	30-64	1430	33
15-59	1430	72	16-60	2000	66	30-63	1130	62	30-63	1730	36	30-65	1145	32	29-65	1510	32
9-60	1700	72	12-61	1600	71	30-64	0730	46	31-63	1100	35						
3-62	0800	55	3-62	1035	66	29-65	0830	38	29-64	1400	42						
23-64	1830	67	30-62	1750	62				28-65	1315	45						
			28-64	0830	59												
			28-65	1130	59												

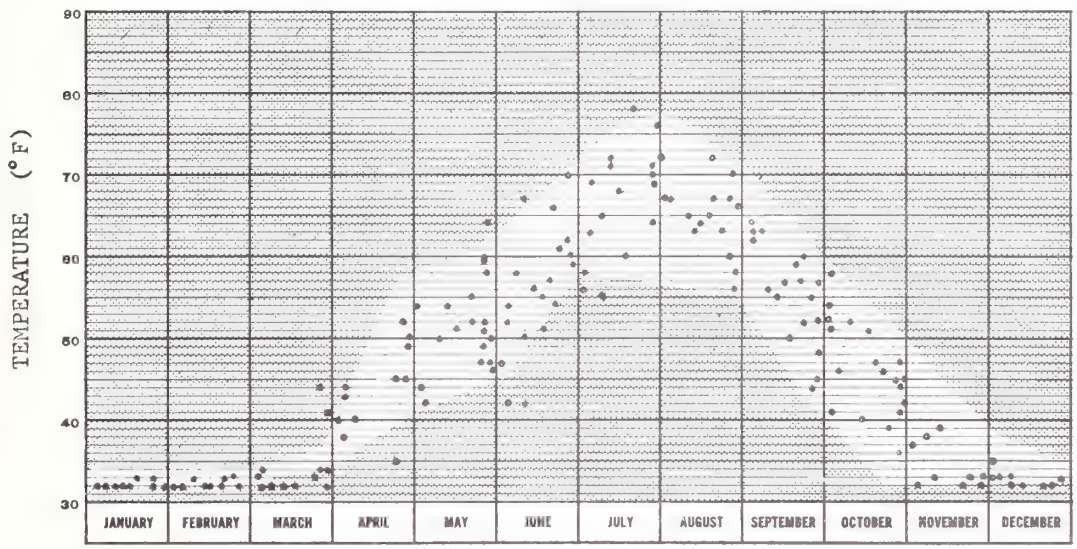
94. Marias River near Shelby, Mont. (6-0995)

Location.--At gaging station, lat 48°26', long 111°53', in SE¼ sec.20, T.31 N., R.2 W., on left bank 200 ft downstream from bridge on U. S. Highway 91, 6 miles south of Shelby, 24 miles downstream from Cut Bank Creek, and at mile 168. Datum of gage is 3,087.72 ft above mean sea level, datum of 1929.

Drainage area.--3,242 sq mi, of which 518 sq mi is probably noncontributing.

Water temperature records available.--176 spot observations made at time of discharge measurements during period March 1949 to December 1965, including 18 observations made at time of water quality sampling. Once-daily observations during period October 1949 to September 1951 published in reports of the Geological Survey. Unpublished once-daily observations during periods September 1949, October to December 1951 are available in files of the Helena District Office.

Extremes.--Discharge 1902-8, 1911-65: Maximum, 241,000 cfs June 9, 1964, largely due to failure of Swift Dam; minimum observed, 10 cfs Aug. 20, 1919.
Water temperatures 1949-65: Maximum observed, 78°F July 25, 1956; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1949-51.

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1949	Max	--	--	--	--	--	--	--	--	--	57	48	38
	Min	--	--	--	--	--	--	--	--	--	33	35	32
1950	Max	33	34	35	48	58	68	71	77	70	54	43	36
	Min	32	32	34	34	44	46	62	60	45	38	32	34
1951	Max	34	34	36	57	60	68	76	77	64	--	--	--
	Min	32	32	34	36	40	45	58	55	42	--	--	--
Extremes for years 1949-51													
	Max	34	34	36	57	60	68	76	77	70	57	48	38
	Min	32	32	34	34	40	45	58	55	42	33	32	32

94. Marias River near Shelby, Mont. (6-0995)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-50	1530	32	13-50	1730	32	4-49	1400	34	5-50	1415	38	24-49	1700	55	11-49	1230	67
4-51	1300	32	12-51	1700	32	30-49	1700	32	3-51	0600	40	3-50	0920	44	2-50	0830	47
8-51	0930	32	13-52	1130	32	2-50	1015	33	5-51	1100	40	6-50	2000	51	14-50	0900	55
9-52	1430	32	26-53	1000	32	6-51	1645	32	3-53	1600	43	2-51	1900	42	4-51	1430	52
8-53	1130	32	3-54	1330	32	17-52	1430	32	3-58	1630	44	10-51	1800	54	6-51	1100	42
6-54	1630	32	1-55	1730	32	9-55	1500	32	30-58	1030	49	9-52	0740	50	17-52	1730	54
5-55	1400	32	3-60	1200	32	10-60	1630	32	1-59	1100	40	26-55	1500	47	10-54	1630	50
6-60	1130	32	28-61	1000	32	29-61	1330	44	30-59	1800	50	26-56	1000	52	16-55	1720	57
31-61	1000	32	7-63	1600	33	27-62	1400	33	29-61	0900	45	24-57	1330	52	20-56	1900	61
29-63	1600	32	27-64	1700	33	30-63	0830	41	29-63	1325	52	28-58	1400	64	17-58	1930	66
29-64	1050	33	26-65	1510	33	29-64	1220	34	28-64	1400	45	1-60	1800	54	4-59	1200	54
13-65	1000	33				30-65	1600	34	28-65	1100	35	27-61	1530	58	4-60	1100	54
29-65	1445	33										30-62	1700	50	27-61	1200	70
												26-63	1815	60	28-62	1200	60
												26-64	1200	51	7-63	1115	58
												30-64	0830	47	29-63	1200	59
												31-64	1945	46	10-64	1530	42
												26-65	1300	49	13-64	1315	56
															14-65	1600	52
															24-65	1700	62
July			August			September			October			November			December		
13-49	1700	72	1-50	1440	67	6-49	1700	63	11-49	1030	40	1-50	1730	37	1-49	1700	35
7-50	0900	69	16-50	0800	63	6-50	0900	62	4-50	0950	41	6-51	0800	32	9-52	1600	32
2-51	1535	56	14-51	1700	65	7-50	1410	63	12-50	1900	51	10-52	1200	33	9-53	1000	33
10-51	1030	55	20-54	1830	65	19-50	1600	59	9-51	1240	52	11-53	1130	39	27-60	1700	32
31-51	1715	72	26-55	1030	63	6-51	1300	64	14-52	1435	47	30-54	1400	33	29-62	1545	32
30-52	0930	70	22-56	1730	72	11-51	1325	55	5-55	1730	46	9-55	1545	38	2-63	0730	33
2-53	1005	58	8-57	1200	67	9-52	1610	56	23-56	1630	39	22-56	1600	32	28-63	1500	32
20-54	1000	60	29-57	1000	58	30-53	1500	48	2-57	1830	58	30-60	1400	32	1-64	0825	33
13-55	1700	71	21-58	0930	67	18-54	1010	50	31-57	1730	42	28-62	1600	33	2-64	1510	33
25-56	1530	78	18-60	1000	64	27-56	1700	52	16-58	1000	46				30-64	0930	33
3-57	1800	63	31-61	0800	66	17-58	1000	57	1-59	0630	52				10-65	1120	32
17-58	1000	68	29-62	1030	56	24-59	1430	57	2-59	0630	54				27-65	1720	32
10-60	1000	65	28-63	1500	70	28-60	1800	55	2-59	1745	51						
31-61	1600	76	27-64	1600	60	29-61	0900	45	30-59	1430	36						
30-62	1800	71	27-65	1700	67	24-62	1405	60	31-61	1200	45						
30-63	0825	64				30-63	0715	57	30-62	1630	47						
30-64	1240	69				29-64	1555	52	30-63	1400	41						
						28-65	1600	44	30-64	1540	44						
									28-65	1000	45						

95. Marias River near Chester, Mont. (6-1015)

Location.--At gaging station, lat 48°18', long 111°05', in SW¼SW¼ sec.34, T.30 N., R.5 E., on left bank 1 mile downstream from Tiber Dam, 4 miles upstream from Pondera Coulee, and 15 miles southwest of Chester. Datum of gage is 2,814.03 ft above mean sea level (Bureau of Reclamation bench mark).

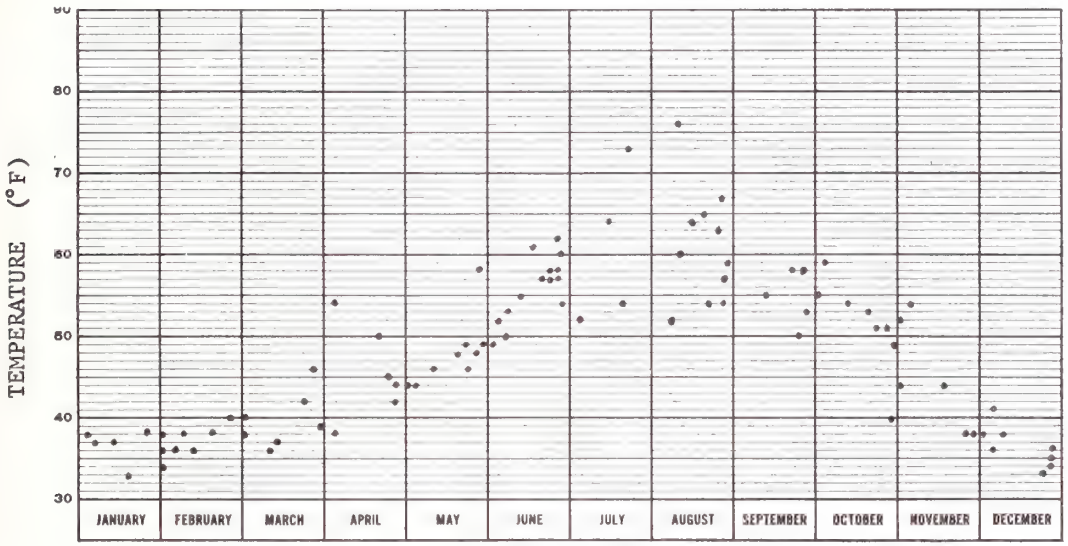
Drainage area.--4,927 sq mi, of which 518 sq mi is probably noncontributing.

Water temperature records available.--93 spot observations made at time of discharge measurements during period May 1956 to December 1965. Once-daily observations during period October 1964 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1921, 1945-47, 1955-65: Maximum not determined, occurred about Mar. 20, 1947 during an ice jam; minimum, probably less than 0.2 cfs during period Oct. 20 to Nov. 10, 1955, when gates at dam were closed.

Water temperatures 1956-65: Maximum observed, 76°F Aug. 8, 1963; minimum observed, 33°F Dec. 28, 1960, Jan. 17, 1962.

Remarks.--Water temperatures affected by storage in Tiber Reservoir. Outlet pipe draws water from bottom of reservoir during periods of regulation.



Spot observations of water temperatures, 1956-65

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1964	Max										56	53	39
	Min										52	38	36
1965	Max	38	38	51	40	44	49	51	67	64	55	50	42
	Min	36	36	36	37	38	42	48	50	55	50	42	36

95. Marias River near Chester, Mont. (6-1015)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
6-60	1600	37	6-58	1100	36	11-60	1100	36	4-58	1000	38	30-56	1230	58	3-57	1600	52
17-62	1100	33	3-60	1700	36	1-61	1100	38	30-58	1530	44	1-57	1100	44	4-59	1630	53
5-63	1100	38	1-61	1230	36	29-61	1700	42	27-61	1430	50	28-58	1930	48	18-59	1800	61
29-64	1430	38	1-62	1710	38	1-63	1330	40	4-62	1100	54	2-60	1330	44	4-60	1830	50
10-65	1340	37	21-62	1200	38	30-63	1445	46	30-64	0925	42	9-62	1800	46	1-61	1645	49
			1-63	1700	34	12-65	1100	37	28-65	1800	45	30-62	1430	49	27-61	1630	60
			27-64	1330	40	31-65	0945	39				1-63	1600	44	28-62	1500	54
			5-65	1240	38							25-63	0920	48	12-64	1740	55
												26-64	1645	49	22-64	1545	57
												26-65	1600	46	23-64	1115	58
															23-64	1715	57
															24-64	0700	57
															24-64	1100	57
															24-64	1555	58
															24-65	1400	62
July			August			September			October			November			December		
26-56	0900	73	23-56	1030	63	16-58	1430	55	25-56	1100	51	22-56	1230	44	29-56	1430	36
4-57	1000	52	8-57	1630	60	24-59	1730	58	31-57	1430	49	30-60	1700	38	5-59	1100	38
16-58	1800	64	20-58	1330	54	28-60	1330	58	15-58	1230	54	1-61	1230	44	28-60	1030	33
24-64	1445	54	18-60	1400	65	26-61	1600	50	30-59	1800	40	29-61	1630	38	1-62	1110	38
			12-61	1200	64	29-65	1600	53	2-63	1000	59	2-62	1640	54	3-63	1030	41
			31-61	1130	59				1-64	0730	55	1-63	1700	52	29-63	0930	34
			7-62	1940	52				24-64	1530	53				3-64	0930	36
			30-62	1100	57				27-65	1300	51				29-65	1730	35
			8-63	1625	76												
			27-64	1200	54												
			27-65	1430	67												

96. Marias River near Brinkman, Mont. (6-1020)

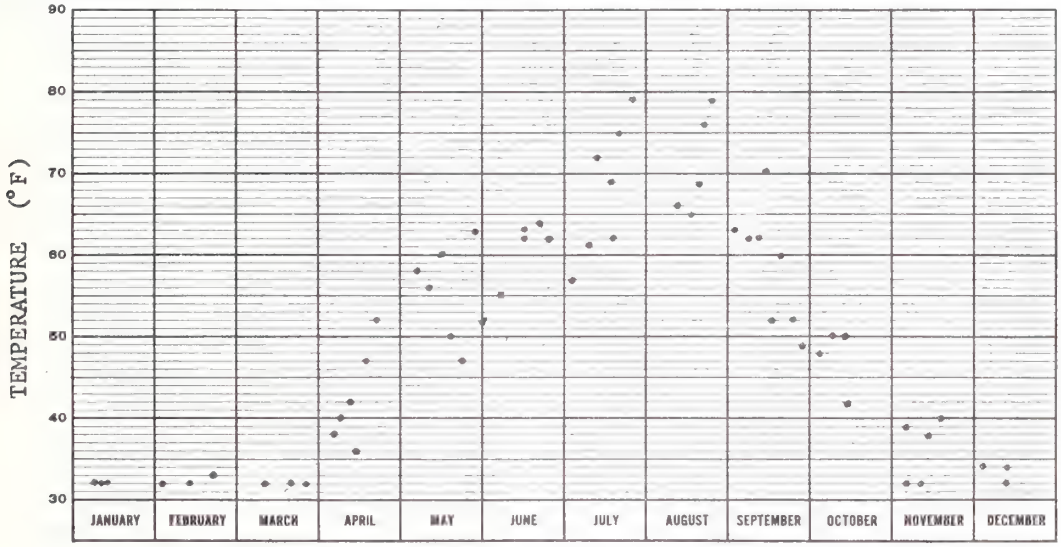
Location.--At gaging station, lat 48°16', long 110°42', in SE¼SE¼ sec.17, T.29 N., R.8 E., on left bank 4 miles southwest of Brinkman Post Office, 14 miles downstream from Cottonwood Creek, 30 miles north of Fort Benton, and at mile 40.2. Datum of gage is 2,677.25 ft above mean sea level, adjustment of 1912.

Drainage area.--6,425 sq mi, of which 518 sq mi is probably noncontributing.

Water temperature records available.--60 spot observations made at time of discharge measurements during period April 1949 to September 1956.

Extremes.--Discharge 1921-56: Maximum, 50,700 cfs June 19, 1948; minimum daily, 1 cfs Dec. 17, 18, 1955.

Water temperatures 1949-56: Maximum observed, 79°F July 29, 1952, Aug. 25, 1955; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-56

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-52	1600	32	12-52	1400	32	19-51	1630	32	5-49	1400	38	10-51	1140	56	1-50	1830	52
7-54	1430	32	25-53	1600	33	28-51	1330	32	6-50	1430	40	15-52	0830	60	8-51	1840	55
6-55	1230	32	12-54	1230	32	9-55	1830	32	12-51	1300	47	8-53	1120	58	16-52	1310	63
			2-55	1230	32				8-52	1450	42	20-54	1600	50	26-53	1230	62
									10-53	1615	36	26-55	1100	47	16-55	1230	62
									17-56	1830	52	30-56	0930	63	22-56	1430	64
July			August			September			October			November			December		
19-50	1400	69	18-50	1200	65	14-49	1300	70	8-51	1600	50	9-49	1800	38	9-52	1200	32
9-51	1520	61	14-51	1040	66	26-50	1230	60	13-52	1830	42	8-50	1045	32	9-53	1300	34
29-52	1650	79	20-54	1130	69	10-51	1650	62	19-54	1030	50	5-51	1300	32	2-54	1500	34
2-53	1400	57	25-55	1810	79	9-52	1100	62	5-55	1130	48	5-52	1130	39			
19-54	1700	62	23-56	1330	76	2-53	1400	63				11-53	1500	40			
14-55	1345	72				30-53	1040	49									
26-56	1200	75				17-54	1100	52									
						28-56	1730	52									

97. Marias River near Loma, Mont. (6-1020.5)

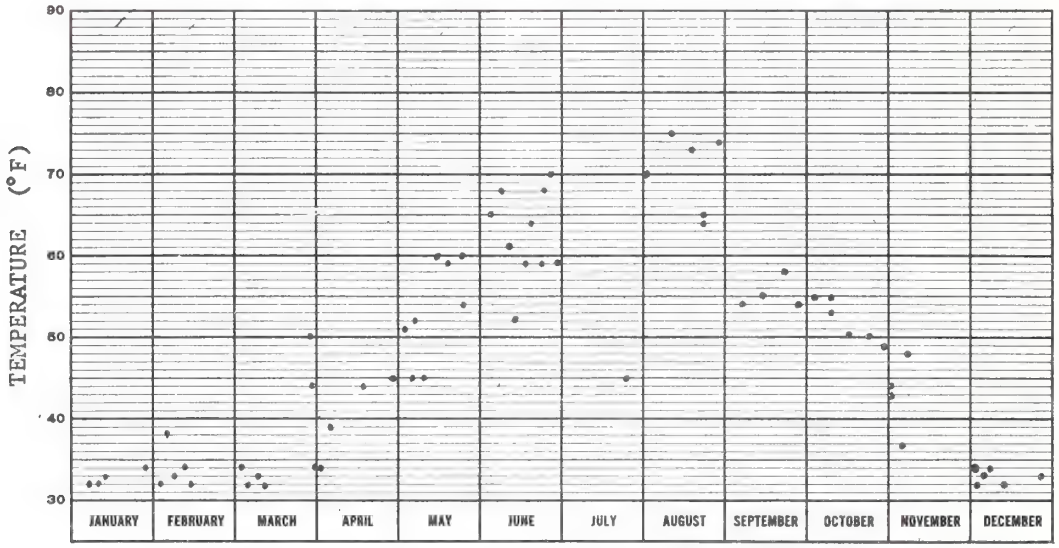
Location.--At gaging station, lat 47°56'45", long 110°34'45", in SE¼SW¼ sec.4, T.25 N., R.9 E., on left bank 3½ miles west of Loma, and 6-3/4 miles upstream from mouth. Altitude of gage is 2,570 ft (from topographic map).

Drainage area.--6,995 sq mi, of which 518 sq mi is probably noncontributing.

Water temperature records available.--66 spot observations made at time of discharge measurements during period November 1959 to December 1965.

Extremes.--Discharge 1959-65: Maximum, 10,800 cfs June 16, 1964; minimum daily, 45 cfs Dec. 11, 1962.

Water temperatures 1959-65: Maximum observed, 75°F Aug. 9, 1962; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1959-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
7-60	1730	32	6-60	1700	32	7-60	1900	32	26-61	1200	44	3-60	1630	52	7-60	1730	68
6-61	1600	32	2-61	1530	32	2-61	1630	34	3-62	1530	39	10-62	1100	60	3-61	1425	65
7-63	0855	32	3-62	1650	38	30-61	1630	50	1-65	1210	34	2-63	1410	51	26-61	1730	68
30-64	1725	34	5-63	1605	34	3-63	0800	32	30-65	1230	45	23-63	1025	59	28-62	1730	70
8-65	1400	33	4-65	1215	33	31-63	0800	43				3-64	1135	45	30-63	1430	59
						31-64	0950	34				5-64	1000	45	11-64	1600	52
						5-65	1350	33				28-64	1215	54	21-64	1230	59
												28-65	1150	60	25-64	1350	59
															13-65	1000	61
															23-65	1510	64
July			August			September			October			November			December		
27-65	1210	45	19-60	1700	73	27-60	1100	59	10-61	0930	50	1-59	1000	44	3-59	1440	33
			1-61	1730	70	13-61	1130	55	7-62	1140	53	1-61	1530	43	13-60	1250	32
			9-62	1300	75	7-62	1220	54	3-63	0910	55	4-62	1040	48	2-62	0800	32
			30-63	1330	74	30-65	1555	54	7-64	1015	55	3-63	0740	37	4-63	1350	34
			26-64	1905	64				31-64	1315	49				29-63	1300	33
			26-65	1720	65				26-65	1510	50				4-64	1705	34

98. Teton River near Dutton, Mont. (6-1080)

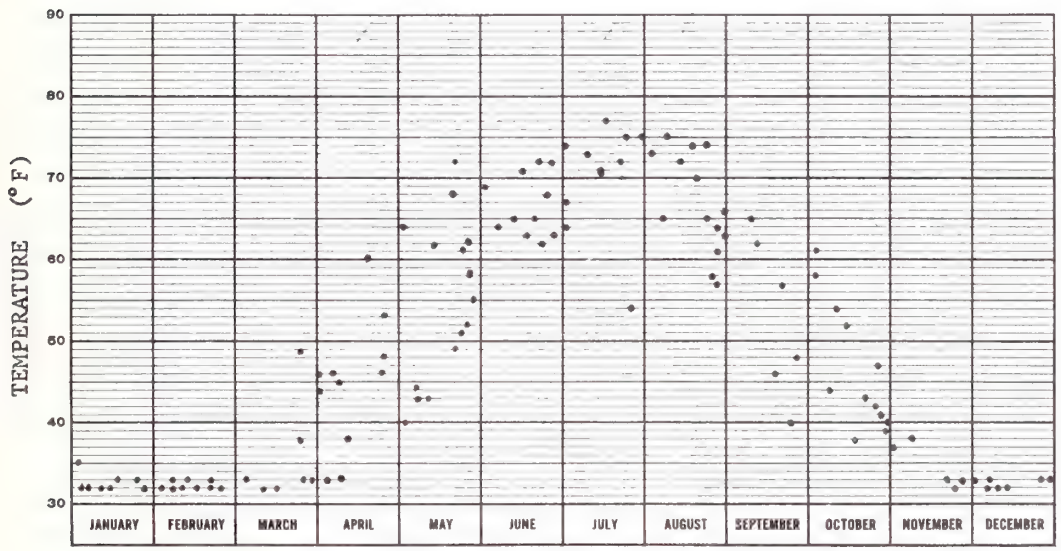
Location.--At gaging station, lat 47°55'45", long 111°33'10", near center of south line of SW¼ sec.12, T.25 N., R.1 E., on right bank 1,500 ft upstream from Kerr Bridge, three-quarters of a mile downstream from Hunt Coulee, and 10 miles northeast of Dutton. Altitude of gage is 3,235 ft (from topographic map).

Drainage area.--1,307 sq mi.

Water temperature records available.--120 spot observations made at time of discharge measurements during period September 1954 to December 1965. Once-daily observations made during period August 1954 to September 1957 and published in reports of the Geological Survey have not been used in this report.

Extremes.--Discharge 1954-65: Maximum, 71,300 cfs June 9, 1964; minimum, 12 cfs Nov. 17, 1963.

Water temperatures 1954-65: Maximum observed, 77°F July 18, 1956; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1954-65.

98. Teton River near Dutton, Mont. (6-1080)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-55	1600	32	3-55	1700	32	9-55	1000	32	12-55	1230	38	28-55	1800	58	15-55	1330	71
2-57	1020	35	2-56	1500	32	12-56	1530	32	20-56	1315	60	23-56	0930	61	20-55	1730	72
10-60	1230	32	5-57	1500	32	9-60	1700	32	3-57	1330	46	2-57	1700	64	23-56	1530	68
3-61	1700	32	28-57	1730	32	27-61	1630	38	1-58	1700	44	22-57	1415	49	16-58	1400	63
29-61	1700	32	7-60	1130	32	29-62	1030	33	28-58	1500	46	26-58	1400	72	1-59	1600	69
9-63	1500	32	26-61	1630	32	27-63	1530	49	1-59	1430	46	28-61	1005	62	18-59	1230	65
27-64	1345	33	5-62	1430	32	27-64	1620	33	28-59	1100	46	9-62	1500	62	6-60	1530	64
13-65	1405	33	6-63	1015	33	4-65	1500	33	28-60	1830	48	22-63	1415	68	27-61	1000	72
			26-63	2000	33				28-63	1820	53	5-64	1845	44	28-62	1000	63
			26-64	1200	33				8-64	1800	45	6-64	1315	43	11-63	2100	65
			3-65	0850	33				28-64	1030	48	7-64	0925	43	22-64	1930	62
									2-65	1215	33	26-64	0810	52			
												29-64	1335	55			
												2-65	1700	40			
												25-65	1700	51			
July			August			September			October			November			December		
21-55	1000	72	2-55	1115	73	14-54	1445	65	7-55	1020	44	1-54	1500	37	8-54	1100	32
18-56	1430	77	12-55	1755	72	26-56	1130	57	23-56	1300	38	30-54	1130	33	5-56	1200	32
24-56	0930	75	21-56	1030	65	16-58	1900	62	2-57	1630	61	29-60	1130	32	6-59	1730	32
1-57	1500	74	7-57	1000	65	22-59	1730	46	29-57	1300	41	6-62	0850	38	1-63	1630	33
14-59	1130	71	29-57	1300	64	29-61	1200	48	15-58	1630	52	28-62	1240	33	31-63	0930	33
8-60	1200	73	20-58	1730	74	28-65	1400	40	28-59	1630	42	29-65	1500	32	5-64	1050	33
31-61	1800	75	18-59	1630	70				31-61	1000	40				29-64	1730	33
1-63	1630	67	16-60	1530	74				2-62	1805	58						
29-63	2000	54	31-61	1830	63				30-63	1100	39						
1-65	1400	64	7-62	1445	75				9-64	1530	54						
			28-62	1740	57				27-64	1630	43						
			31-63	1100	66				29-65	1700	47						
			26-64	0930	58												
			29-65	1700	61												

99. Missouri River at Virgelle, Mont. (6-1095)

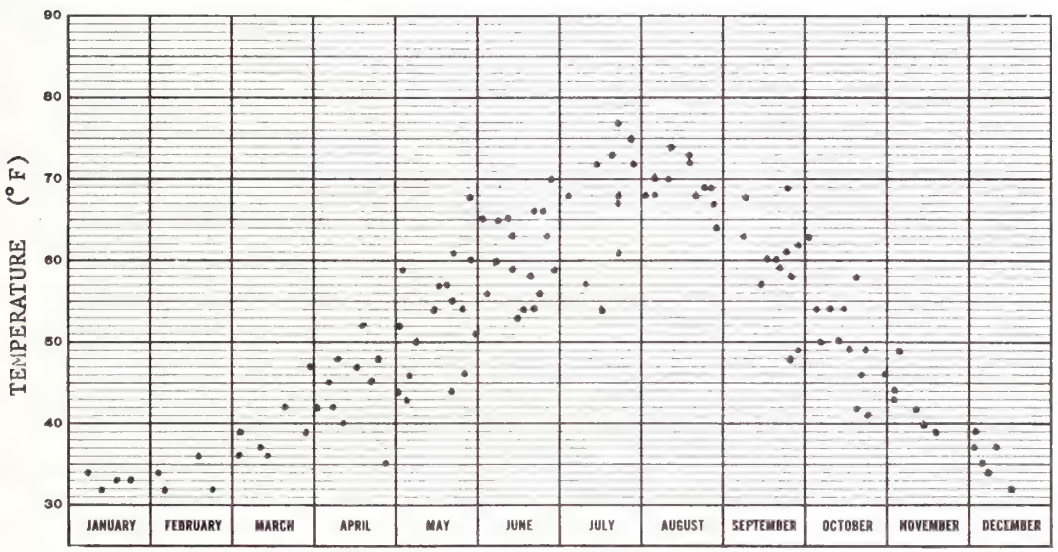
Location.--At gaging station, lat 48°00'14", long 110°15'19", in SW¼SE¼ sec.13, T.26 N., R.11 E., on left bank a quarter of a mile upstream from Virgelle Ferry, half a mile southwest of Virgelle, 3 miles downstream from Spring Coulee, and at mile 2,032.6. Datum of gage is 2,507.50 ft above mean sea level, datum of 1929.

Drainage area.--34,379 sq mi.

Water temperature records available.--122 spot observations made at time of discharge measurements during period April 1949 to December 1965. Prior to Sept. 30, 1953, at site at Loma, 18 miles upstream at datum 2,543.40 ft above mean sea level.

Extremes.--Discharge 1935-65: Maximum, 122,000 cfs June 5, 1953; minimum daily, 638 cfs July 5, 1936.

Water temperatures 1949-65: Maximum observed, 77°F July 16, 1959; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

99. Missouri River at Virgelle, Mont. (6-1095)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
15-51	1700	33	26-53	1130	32	24-59	1530	42	6-49	1500	48	9-51	1800	57	3-49	1030	56
22-53	1100	33	4-60	1730	32	2-61	1300	36	4-50	1815	45	7-52	1300	54	22-49	1500	66
8-60	1130	32	2-61	1230	34	2-63	1530	39	16-52	1400	47	20-54	1200	44	7-51	1740	55
6-61	1200	34	21-64	1155	36	31-63	1645	47	1-53	1300	42	29-56	1200	60	11-52	1500	63
6-63	1430	34				11-64	1145	36	27-55	1400	48	2-57	1050	59	15-54	1300	54
						30-64	1530	39	17-56	1320	52	25-57	1155	55	15-55	1800	66
						10-65	1700	37	4-58	1730	45	1-58	1330	44	14-57	1410	58
									26-61	1830	45	29-58	1330	68	18-58	1900	66
									4-62	1630	42	1-59	1300	52	5-59	1530	65
									8-65	1415	40	14-60	1830	50	5-60	1700	60
									29-65	1745	35	10-62	1600	57	2-61	1100	65
												31-62	1630	51	29-62	1300	70
												3-63	0910	46	11-63	0830	59
												23-63	1440	61	30-63	1010	59
												2-64	1400	43	12-64	1400	53
												27-64	1640	54	13-64	1300	54
												27-65	1700	46	20-64	1635	56
															23-65	2000	63
July			August			September			October			November			December		
16-52	1300	68	1-50	1940	68	30-49	1530	62	19-50	1015	58	14-51	1400	40	18-52	1230	32
9-53	1300	57	20-52	1700	68	19-51	1530	61	17-51	1430	42	18-52	1630	39	3-54	1030	35
16-54	0800	61	25-55	1225	69	24-52	1530	69	15-52	1500	49	12-53	1100	42	6-61	1500	37
14-55	1830	73	24-56	1000	69	10-53	1200	57	4-55	1600	50	2-61	1130	44	2-62	1430	37
26-56	2000	75	9-57	1300	74	29-53	1530	48	3-56	1130	54	3-62	1410	49	4-63	0850	34
4-57	1800	68	29-57	1930	64	16-54	1130	59	26-56	1300	41	2-63	1600	43	2-65	1100	39
16-58	1230	67	19-58	1600	72	15-58	1830	60	1-57	1830	63						
16-59	1330	77	19-60	1400	73	25-59	1700	58	14-58	1800	54						
11-61	1230	72	2-61	1300	70	13-61	1530	60	31-59	1630	46						
26-64	1930	72	8-62	1930	70	6-62	1200	63	10-61	1300	50						
13-65	1830	54	2-63	1300	68	6-63	1100	68	6-62	1325	54						
			26-65	1500	67	30-65	1315	49	24-64	0930	46						
									26-65	1800	49						

100. South Fork Judith River near Utica, Mont. (6-1098)

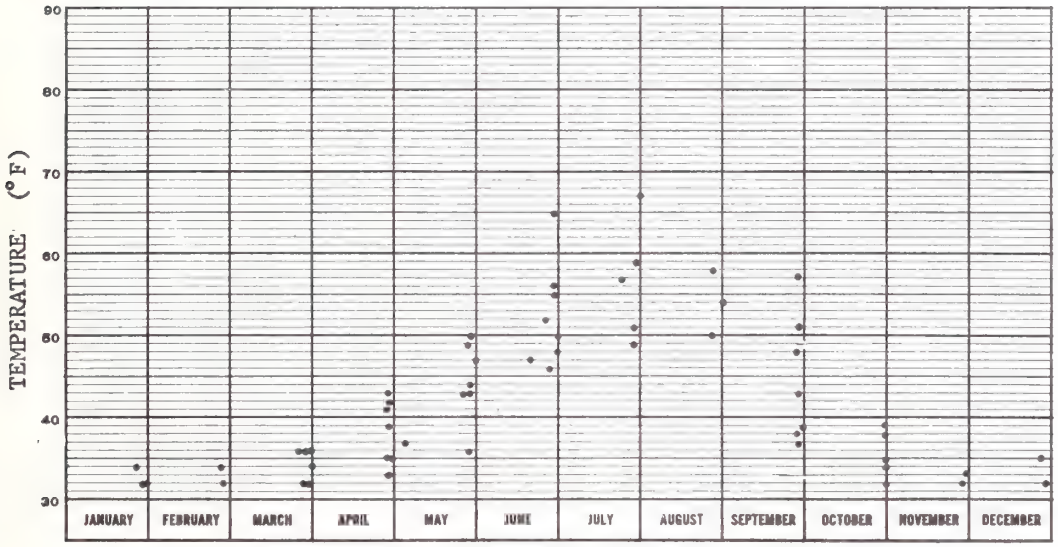
Location.--At gaging station, lat 46°45', long 110°19', in S½ sec.34, T.12 N., R.11 E., on right bank just downstream from Trask Gulch, 8 miles upstream from confluence with Middle Fork and 18 miles southwest of Utica. Altitude of gage is 5,300 ft (from topographic map).

Drainage area.--58.7 sq mi.

Water temperature records available.--61 spot observations made at time of discharge measurements during period September 1958 to December 1965.

Extremes.--Discharge 1958-65: Maximum, 1,290 cfs June 8, 1964; minimum daily, 1.0 cfs Nov. 27, 1958.

Water temperatures 1958-65: Maximum observed, 67°F July 31, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1958-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
31-63	1200	32	26-62	1445	32	31-59	1330	34	29-59	1330	42	28-59	1400	36	30-59	1430	48
29-64	1230	32	26-63	1300	34	30-60	1300	36	28-60	1330	33	31-60	1630	47	29-60	1300	55
26-65	1330	34				31-61	0930	36	28-61	1700	41	30-61	1300	50	29-61	1700	65
						29-62	1130	36	26-62	1000	35	29-62	1450	44	27-62	0810	46
						26-63	1625	36	29-63	1440	43	29-63	0940	43	25-63	1720	52
						27-64	1300	32	29-64	1030	39	6-64	1220	37	18-64	1240	47
						30-65	1300	32	28-65	1345	35	26-64	1530	49	28-64	1200	56
												27-65	1500	43	30-65	1230	50
July			August			September			October			November			December		
29-60	0730	51	27-59	1000	50	30-58	1300	39	31-58	1730	32	28-62	1330	33	29-63	1200	32
31-61	1600	67	31-60	1500	54	30-59	1500	37	30-59	1230	38	25-63	1600	32	29-64	1500	32
28-62	0730	49	27-63	1600	58	29-60	1540	48	31-60	1800	34				28-65	1400	35
29-63	1730	59				29-61	1600	43	31-61	1700	35						
20-65	1200	57				26-62	1250	51	30-62	1150	39						
						27-63	1430	57	29-63	1500	38						
						28-65	1340	38									

101. Judith River near Utica, Mont. (6-1100)

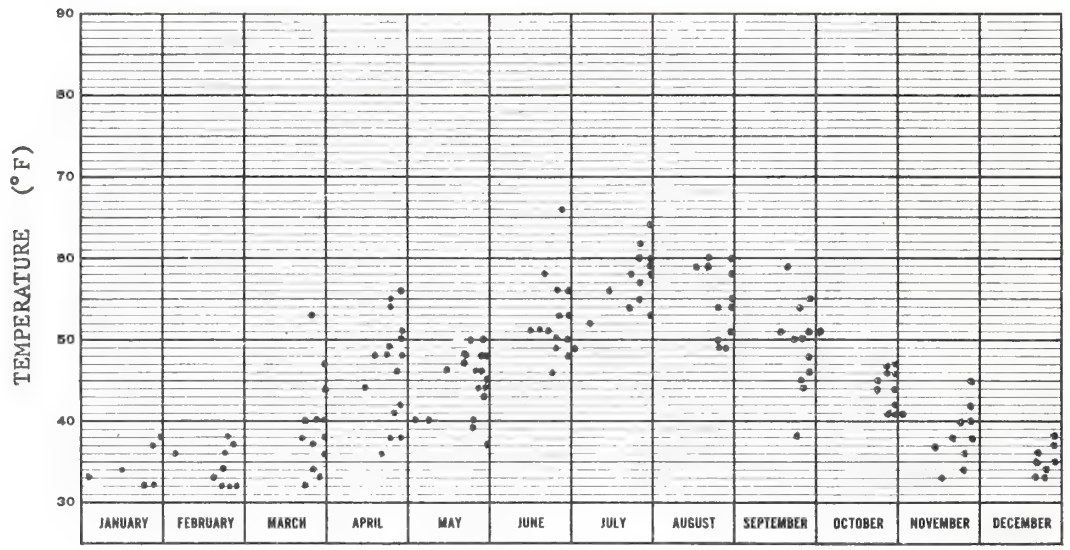
Location.--At gaging station, lat 46°54', long 110°14', in NW¼ sec.17, T.13 N., R.12 E., on left bank at Noel Ranch, 3½ miles downstream from confluence of South and Middle Forks, 9 miles southwest of Utica, and at mile 99.3. Altitude of gage is 4,790 ft (by barometer).

Drainage area.--328 sq mi.

Water temperature records available.--163 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1919-65: Maximum observed, 1,120 cfs June 11, 12, 1927; no flow Mar. 19-21, 1933.

Water temperatures 1949-65: Maximum observed, 66°F June 29, 1961; minimum, freezing point on some days during winter months.



Spot observations of water temperatures, 1949-65

101. Judith River near Utica, Mont. (6-1100)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
2-52	1510	33	28-52	1600	37	31-51	0930	36	26-49	0930	48	22-49	1100	46	30-51	1530	50
31-52	1400	38	27-53	1200	38	31-52	1700	40	30-51	1430	42	27-49	0930	46	30-52	1500	56
30-53	0930	37	26-54	1030	36	31-53	1600	47	30-52	1230	42	18-50	1100	40	30-53	1600	56
30-63	1200	32	27-56	1830	32	31-55	1100	38	30-53	1300	48	30-50	1230	43	30-54	1500	56
29-64	0900	32	26-58	1030	36	29-56	1730	37	30-54	1100	38	31-51	1500	37	28-55	1100	49
26-65	1500	34	26-62	1330	32	28-57	1130	40	28-55	1400	48	27-53	1500	47	14-56	1400	51
			7-63	0900	36	28-58	1030	38	25-56	1300	44	28-54	1100	39	25-56	1400	58
			26-63	0945	34	31-59	1130	40	30-57	1500	50	31-55	1300	45	27-57	1000	46
			28-64	0930	32	30-60	1030	40	30-58	1530	51	30-56	1300	44	27-58	1100	56
			24-65	1530	33	31-61	1100	44	29-59	1100	46	30-57	1130	46	30-59	1200	48
						29-62	0940	34	28-60	1055	38	29-58	1030	50	29-60	1100	53
						26-63	1440	53	28-61	1845	49	28-59	1200	40	29-61	1445	66
						27-64	1015	32	26-62	0805	36	31-60	1430	48	27-62	1000	51
						30-65	1430	33	29-63	1245	55	30-61	0900	48	25-63	1500	51
									29-64	1230	56	29-62	1315	46	28-64	1300	50
									28-65	1510	41	29-63	1125	44	30-65	1430	53
												6-64	1000	40			
												26-64	1330	50			
												27-65	1630	48			
July			August			September			October			November			December		
1-49	1200	49	31-50	1630	60	29-50	1020	44	1-49	1030	51	30-50	1130	38	30-52	1100	38
28-49	0930	58	31-51	1000	51	30-52	1530	55	30-50	1435	47	1-51	1500	41	30-53	1130	37
31-50	1600	53	29-52	0830	49	30-53	1100	51	1-51	1730	51	30-51	1500	42	28-56	1030	35
31-51	1330	58	31-53	1300	58	30-54	1100	48	31-52	1200	46	29-52	1330	40	30-57	1400	35
31-52	1700	60	31-54	1530	60	30-55	1100	46	30-53	1100	46	30-53	1330	45	29-59	1300	33
31-53	1300	60	31-55	1230	58	28-56	1100	50	29-54	1100	44	30-54	1600	40	28-62	1115	33
29-54	1100	55	29-56	1030	50	30-57	1600	58	31-55	1530	42	29-56	0930	34	29-63	1030	34
29-55	1500	60	29-57	1000	54	30-58	1100	46	31-56	1300	41	29-57	1430	36	29-64	1400	33
31-56	1500	60	29-58	1200	54	30-59	1300	46	30-57	1200	47	28-62	1145	38	28-65	1520	36
31-57	1130	59	27-59	1300	59	29-60	1100	50	31-58	1600	44	25-63	1430	33			
29-60	1130	57	31-60	1130	54	29-61	1130	45	30-59	1000	41	24-64	1530	37			
31-61	1730	64	30-62	0900	49	26-62	1035	51	31-60	1400	47	30-65	1445	38			
28-62	0900	54	27-63	1400	60	27-63	1530	59	31-61	1430	47						
29-63	1600	62	25-65	1500	59	29-64	1440	54	30-62	0945	41						
8-65	1200	52	31-65	1200	55	28-65	1500	38	29-63	1600	45						
20-65	1000	56															

102. Ross Fork near Hobson, Mont. (6-1110)

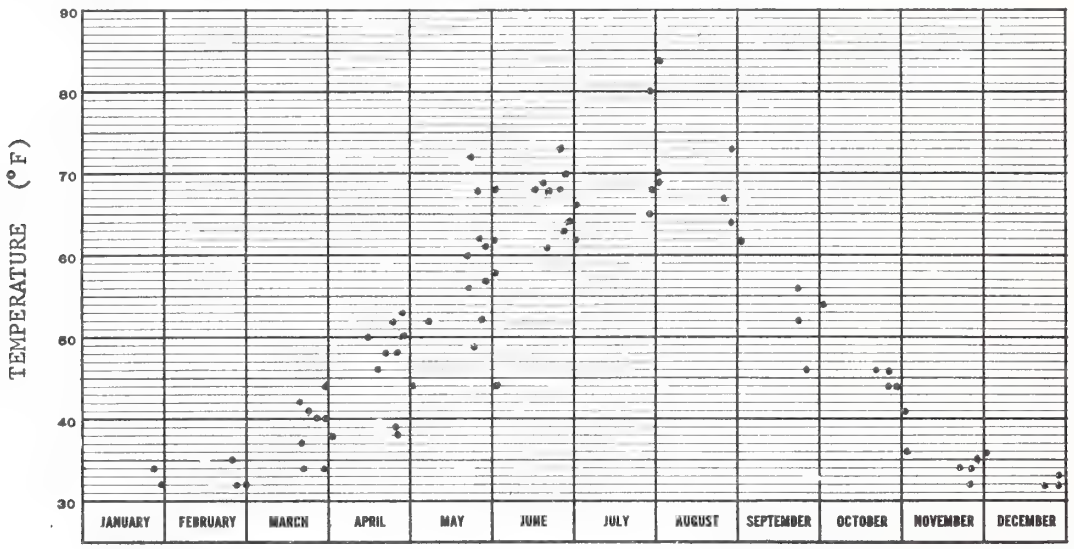
Location.--At gaging station, lat 46°59', long 109°48', in NW¼ sec.11, T.14 N., R.15 E., on left bank 1 mile downstream from Hauck Coulee, 3½ miles east of Hobson, and 7 miles upstream from mouth. Altitude of gage is 3,860 ft (by barometer).

Drainage area.--337 sq mi.

Water temperature records available.--81 spot observations made at time of discharge measurements during periods April 1949 to December 1953, March 1955 to September 1962.

Extremes.--Discharge 1946-53, 1955-62: Maximum, 2,640 cfs May 21, 1962; no flow at times.

Water temperatures 1949-53, 1955-62: Maximum observed, 84°F Aug. 1, 1951; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1955-62

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
31-52	1700	32	29-52	1430	32	30-51	1730	40	26-49	1130	48	27-49	1100	60	28-50	1300	68
29-53	1500	34	25-58	1430	35	31-52	1500	34	27-50	1830	39	29-50	1605	62	1-51	1600	44
			26-62	1145	32	31-53	1300	43	1-52	1730	38	1-51	1500	44	29-51	1330	58
						30-56	1100	40	29-52	1230	52	30-52	1500	57	1-53	1430	68
						28-57	1000	34	29-53	1330	48	27-53	1230	56	29-53	1500	70
						28-58	1430	42	27-55	1600	46	8-56	1930	52	1-55	1430	58
						31-59	1600	40	30-57	1200	53	30-56	1730	61	27-55	1500	68
						29-60	1630	41	30-58	1330	50	29-57	1630	68	25-56	1830	68
						28-62	1300	37	28-59	1600	48	28-58	1700	72	26-57	1400	61
									28-60	1700	38	28-59	1830	49	26-58	1430	69
									29-61	1600	52	29-62	1100	52	30-59	1700	64
									25-62	1620	50				1-60	1600	62
															28-60	1530	73
July			August			September			October			November			December		
1-49	1330	66	1-50	1930	69	28-50	1250	52	31-50	1545	44	29-50	1230	34	1-53	1230	36
28-49	1100	65	30-50	1605	73	29-59	1530	46	1-52	1030	54	2-51	1500	36	27-56	1700	32
1-52	1100	62	1-51	1400	84	1-60	1400	62	30-52	1500	46	30-51	1700	35	30-57	1200	32
30-53	1330	80	30-51	1200	64	28-60	1630	56	30-57	1630	44	28-52	1600	34	30-59	1130	33
29-55	1230	68	1-52	1400	70				27-59	1800	46	29-56	1430	34			
			28-52	1230	67							29-57	1230	32			
												1-60	1530	41			

103. Big Spring Creek near Lewistown, Mont. (6-1115)

Location.--At gaging station, lat 47°00'20", long 109°21'00", in SW¼NW¼ sec.5, T.14 N., R.19 E., on upstream side of left wingwall of old highway bridge, half a mile downstream from Big Springs and 5 miles southeast of Lewistown. Altitude of gage is 4,130 ft (by barometer).

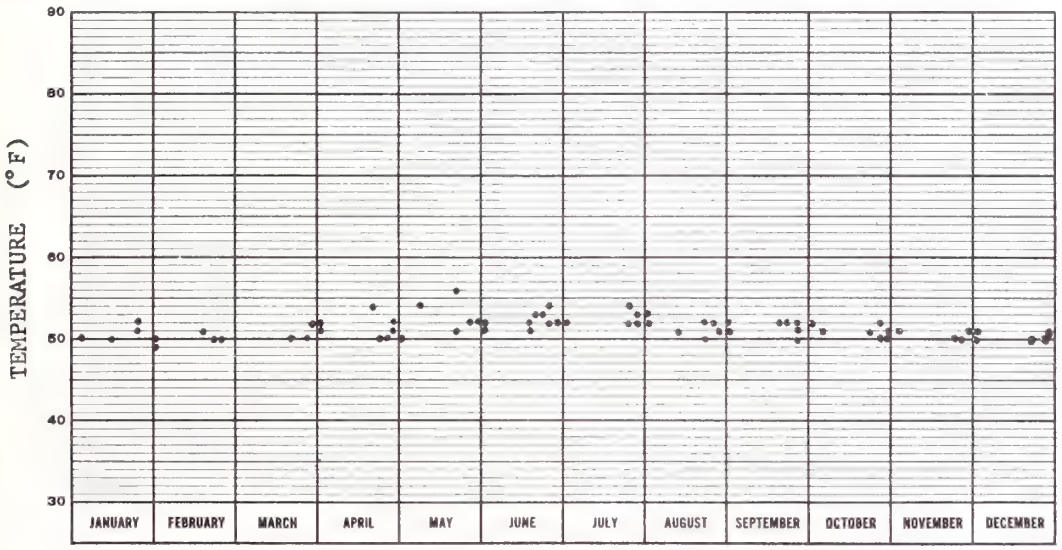
Drainage area.--20.9 sq mi.

Water temperature records available.--87 spot observations made at time of discharge measurements during period April 1949 to October 1957.

Extremes.--Discharge 1932-57: Maximum, 250 cfs May 30, 1953; minimum observed, 76 cfs Feb. 1-8, 1938.

Water temperatures 1949-57: Maximum observed, 56°F May 27, 1949; minimum observed, 49°F Feb. 1, 1957.

Remarks.--Water temperatures affected by Big Springs.



Spot observations of water temperatures, 1949-57

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-52	0930	50	1-52	1000	50	31-54	1400	52	26-49	1430	54	27-49	1400	56	28-50	1530	53
29-53	1315	52	28-52	0930	50	30-55	1500	50	28-50	1200	50	29-50	1100	52	1-51	0900	51
29-54	1500	51	27-53	1630	50	30-56	0900	52	1-52	1000	52	1-51	1000	50	29-51	1600	52
18-56	1230	50	25-54	1400	51	27-57	1900	50	29-52	1730	50	31-52	0900	52	29-53	1700	54
			1-57	1030	49				1-53	0930	51	27-53	0930	51	30-54	1230	52
			28-57	1000	50				30-53	1000	51	27-54	1700	51	1-55	1130	52
									29-54	1500	50	9-56	0830	54	27-55	1230	53
									28-55	1000	50	31-56	0930	52	26-56	0930	52
									30-57	1000	52	29-57	1800	52	26-57	1830	51
July			August			September			October			November			December		
28-49	1430	54	22-49	1700	51	1-50	1700	51	31-50	0955	51	29-50	1700	50	1-51	0930	51
1-52	0800	52	1-50	0930	53	28-50	1620	52	3-51	0930	51	2-51	1000	51	29-52	1530	50
30-53	1030	53	1-51	0800	52	1-53	0800	51	1-52	0930	52	29-52	1000	50	1-53	0900	50
30-54	0930	52	30-51	1730	51	29-53	1700	51	30-52	1700	50	30-54	1300	51	29-53	1700	50
29-55	1030	52	1-52	1030	52	1-54	0930	52	29-53	1630	52	28-56	1730	50	30-54	1400	51
30-57	1500	52	28-52	0830	52	29-54	1530	52	28-54	1700	51				1-55	0930	50
			30-55	1830	51	29-55	1400	50	31-55	1230	50				29-55	1700	50
			1-56	1030	52	27-56	1530	52	31-56	0930	50				27-56	1330	50
			28-56	1800	50				1-57	1000	52						
			29-57	1500	52												

104. Wolf Creek near Stanford, Mont. (6-1145)

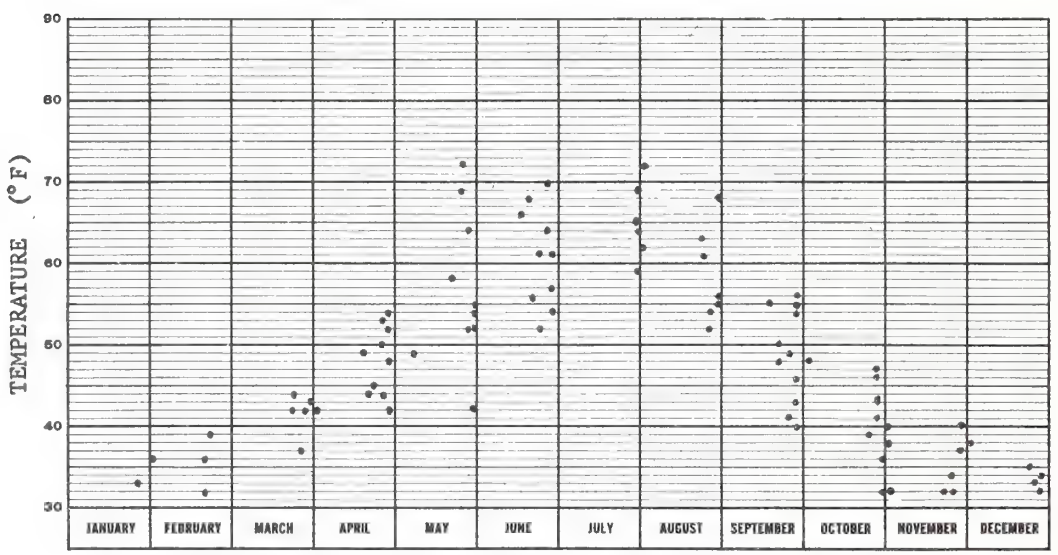
Location.--At gaging station, lat 47°07', long 110°17', in NE¼SE¼ sec.26, T.16 N., R.11 E., on right bank half a mile downstream from confluence of Dry Wolf and Running Wolf Creeks and 4 miles southwest of Stanford. Altitude of gage is 4,490 ft (by barometer).

Drainage area.--112 sq mi.

Water temperature records available.--90 spot observations made at time of discharge measurements during periods April 1950 to November 1953, March 1955 to December 1958, July 1959 to September 1962.

Extremes.--Discharge 1950-53, 1955-62: Maximum, 578 cfs June 4, 1953; no flow Nov. 17, 1951.

Water temperatures 1959-53, 1955-58, 1959-62: Maximum observed, 72°F May 29, 1958, Aug. 1, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures 1959-53, 1955-58, 1959-62

104. Wolf Creek near Stanford, Mont. (6-1145)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-53	1700	33	1-52	1400	36	31-53	1800	43	30-50	1200	42	30-50	1635	52	28-50	0930	52
			27-53	1400	39	28-57	1400	42	30-51	1700	48	31-51	1800	42	30-51	1200	54
			26-58	1200	36	28-58	1230	44	1-52	1430	42	31-52	1330	52	30-52	1700	61
			26-62	1645	32	30-60	1600	42	29-52	1500	50	26-53	1630	58	30-53	1200	57
						29-62	1400	37	29-53	1530	44	31-55	1630	54	28-55	1300	61
									27-55	1730	44	8-56	1800	49	25-56	1630	66
									30-57	1800	54	30-56	1500	64	26-57	1600	56
									30-58	1800	52	29-57	1500	69	26-58	1600	68
									28-60	1530	45	29-58	1230	72	2--60	1600	64
									29-61	1400	53	31-60	1900	55	29-61	1200	70
									26-62	1200	49						
July			August			September			October			November			December		
31-50	1900	59	31-51	1345	55	29-50	1325	41	30-50	1700	46	30-50	1515	37	1-51	1300	38
31-51	1830	64	1-52	1700	62	30-52	1730	55	2-51	1345	48	2-51	1700	32	30-52	1500	34
30-53	1600	65	28-52	1600	61	30-53	1530	54	30-52	1130	43	28-52	1400	32	28-56	1300	35
29-55	1700	65	31-55	1500	68	30-55	1300	43	30-53	1530	46	30-53	1600	40	30-57	1530	32
31-56	1700	69	29-56	1230	52	28-56	1500	50	31-55	1700	32	29-56	1130	34	29-59	1530	33
31-57	1530	59	29-57	1230	54	30-57	1830	56	31-56	1530	36	29-57	1630	32			
			28-58	1700	63	30-58	1600	46	30-57	1400	47	1-60	1730	38			
			31-60	1800	56	30-59	1730	40	30-58	1300	41	1-61	1500	40			
			1-61	1630	72	29-60	1800	49	29-59	1430	39						
			29-62	1415	52	28-61	1400	48									
						27-62	0900	55									

105. Missouri River at powerplant ferry, near Zortman, Mont. (6-1150)

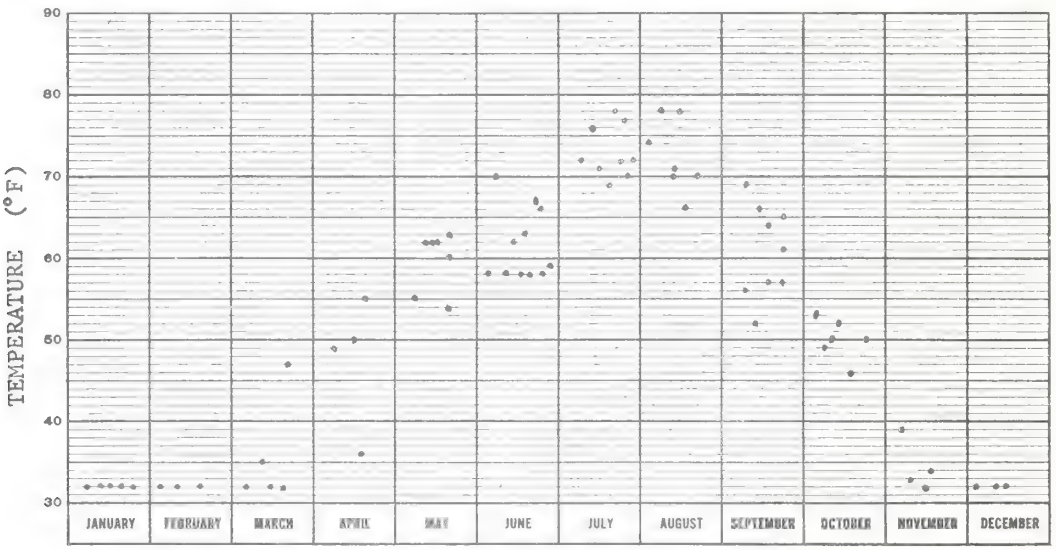
Location.--At gaging station, lat 47°43'51", long 108°56'06", in NE¼NE¼ sec.30, T.23 N., R.22 E., on left bank at powerplant ferry, 1½ miles downstream from Woodhawk Creek, 22 miles southwest of Zortman, and at mile 1,938.1. Datum of gage is 2,273.02 ft above mean sea level (levels by Corps of Engineers).

Drainage area.--40,763 sq mi.

Water temperature records available.--75 spot observations made at time of discharge measurements during period July 1949 to December 1965.

Extremes.--Discharge 1934-65: Maximum, 137,000 cfs June 6, 1953; minimum, 1,120 cfs July 8, 1936.

Water temperatures 1949-65: Maximum observed, 78°F July 20, 1960, Aug. 12, 1963, Aug. 16, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
22-54	1130	32	10-61	1005	32	23-61	1125	47	20-60	1430	50	17-50	1130	62	28-51	1200	59
18-62	1230	32	22-62	1200	32	15-62	1330	32	12-62	1755	49	24-52	1430	63	13-52	1100	63
16-63	1630	32	4-64	1130	32	13-63	1645	35	23-63	1600	55	24-60	1235	54	21-60	1135	58
9-64	1245	32	22-65	1415	32	5-64	1200	32	21-65	1345	36	9-61	1440	55	8-61	1130	70
15-65	1315	32				19-65	1320	32				24-62	1355	60	5-62	1800	58
												16-63	1500	62	18-62	2010	66
												18-64	1430	62	17-63	1400	67
															9-64	1830	58
															11-64	1045	62
															12-64	1700	58
															15-64	1800	58
July			August			September			October			November			December		
19-49	1730	69	15-51	1700	70	15-50	1500	57	16-51	1230	49	10-61	1120	33	16-61	1310	32
24-52	1230	70	20-54	1200	70	18-51	1900	64	20-54	1530	52	16-61	1145	32	14-61	1325	32
27-54	1200	72	17-60	1210	66	22-54	1800	65	18-61	1710	50	8-62	1615	39	2-63	1400	32
20-60	1220	78	15-61	1200	70	13-60	1220	66	9-62	1300	53	17-65	1130	34			
11-61	1410	72	15-62	1535	71	20-61	1300	57	23-64	1205	46						
24-62	1705	77	12-63	1300	78	12-62	1015	52	27-65	1245	50						
17-63	1500	71	4-64	1830	74	10-63	1115	69									
14-64	1500	76	16-65	1845	78	10-64	1530	56									
22-65	1200	72				21-65	1245	56									

106. North Fork Musselshell River near Delpine, Mont. (6-1155)

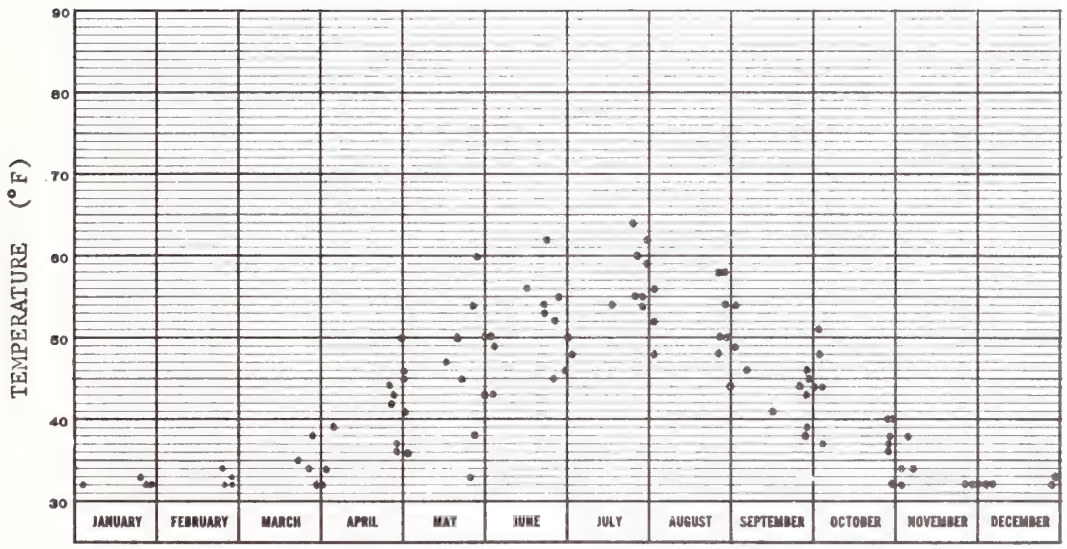
Location.--At gaging station, lat 46°38', long 110°35', in SW¼SE¼ sec.22, T.10 N., R.9 E., on right bank half a mile upstream from high-water line of Durand Reservoir at elevation 5,330 ft, 1 mile downstream from Lion Creek, and 4 miles northwest of Delpine. Altitude of gage is 5,380 ft (by barometer).

Drainage area.--31.4 sq mi.

Water temperature records available.--134 spot observations made at time of discharge measurements during period April 1951 to December 1965.

Extremes.--Discharge 1940-65: Maximum, 423 cfs Apr. 1, 1950; minimum, 1.6 cfs Aug. 16, 1941.

Water temperatures 1951-65: Maximum observed, 64°F July 24, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-65

106. North Fork Musselshell River near Delpine, Mont. (6-1155)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-58	1000	32	26-53	1400	32	25-53	1000	34	4-51	1000	34	31-50	1230	43	3-52	1100	49
29-62	1230	32	24-54	1100	34	28-60	1430	38	2-52	1300	34	2-51	1100	36	2-53	1700	50
29-63	1130	32	25-62	1200	32	22-63	1015	35	29-53	0930	37	1-52	1500	46	22-53	1500	54
28-64	1130	32	27-63	0945	33	26-64	1000	32	29-54	1000	36	27-54	1000	38	2-55	1100	43
25-65	1700	33	27-64	1030	32	29-65	1400	32	1-55	1100	32	1-57	1030	45	24-55	1100	50
			24-65	0900	32				27-55	1100	35	28-57	1100	50	1-56	1100	50
									5-56	1400	39	1-58	1030	41	26-56	1530	58
									3-57	1100	34	27-58	1830	60	26-57	0930	47
									27-59	1300	42	26-59	1600	46	25-58	1230	52
									26-60	1400	40	21-62	1430	45	22-59	1500	53
									30-61	1600	50	28-63	1120	50	2-60	1100	50
									25-62	0900	44	15-64	1200	47	27-60	1430	55
									30-63	1340	50	19-64	1200	50	22-61	1530	62
									28-64	1000	37	25-64	1600	54	26-62	1930	51
									27-65	1305	43	26-65	1535	33	25-63	0750	45
															14-64	1130	56
															28-64	1000	46
															30-65	1000	46
July			August			September			October			November			December		
16-50	1730	54	2-50	0930	48	14-50	1130	41	4-50	1040	37	5-50	1100	38	6-49	1500	32
2-52	1000	48	2-51	0830	52	6-51	1030	46	3-52	1100	44	6-51	1200	34	5-50	1200	32
30-52	1700	62	27-52	1430	55	28-51	1500	46	29-52	1200	37	2-60	1200	34	4-51	1100	32
1-54	1000	50	30-55	1100	50	2-53	0900	49	1-53	0930	44	2-61	1200	32	30-52	0930	33
28-54	1000	54	2-56	1130	56	2-54	1400	54	29-53	1130	40	27-62	1020	32	2-53	0900	32
28-55	1130	55	31-56	1030	44	29-54	1030	40	28-54	1100	36	25-63	1000	32	1-54	1100	32
23-57	0900	50	28-57	1100	50	28-55	1030	43	2-56	1630	51	30-65	0910	32	2-57	1500	32
26-60	1630	60	27-58	1530	58	28-59	1400	39	30-56	1100	32				27-58	1100	32
24-61	1800	64	26-59	1000	48	27-60	1500	44	2-57	1100	48				28-59	1300	32
26-62	1220	55	29-60	1430	54	27-61	1200	39	29-57	1100	36				27-62	1130	32
30-63	1500	59	29-61	1100	58	25-62	0910	44	28-58	1500	40				28-63	1130	32
			27-63	0800	49	27-63	1200	51	28-59	1130	37				29-64	0915	32
						27-65	1430	38	30-62	1540	40				27-65	1515	32
									29-63	1230	38						

107. South Fork Musselshell River above Martinsdale, Mont. (6-1185)

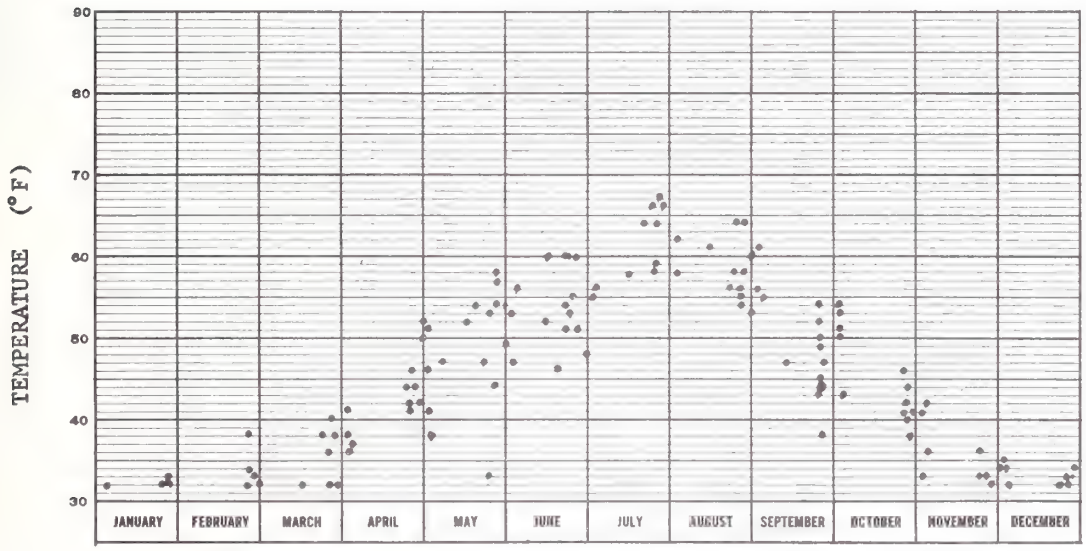
Location.--At gaging station, lat 46°27', long 110°23', in NW¼ sec.17, T.8 N., R.11 E., on left bank 2 miles downstream from Cottonwood Creek, 3 miles west of Martinsdale, and 6 miles upstream from confluence with North Fork. Altitude of gage is 4,900 ft (by barometer).

Drainage area.--287 sq mi.

Water temperature records available.--138 spot observations made at time of discharge measurements during period July 1949 to December 1965.

Extremes.--Discharge 1941-65: Maximum, 1,240 cfs June 5, 1948; minimum, 0.1 cfs Aug. 28 to Sept. 2, 1949, Mar. 29, 1950.

Water temperatures 1950-65: Maximum observed, 67°F July 29, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1950-65

107. South Fork Musselshell River above Martinsdale, Mont. (6-1185)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-58	1200	32	24-54	1430	38	25-53	1230	40	4-51	1530	41	2-50	1700	38	3-52	1530	56
29-63	1630	32	29-56	1130	32	14-55	1530	32	29-53	1200	42	31-50	1600	49	1-53	1830	53
28-64	1500	33	24-58	1700	34	26-58	1730	36	28-54	1700	44	2-51	1530	41	2-55	1400	47
25-65	1400	32	25-62	1000	32	28-60	1800	38	1-55	1430	38	1-52	1830	46	24-55	1330	53
			27-63	1200	33	27-62	1200	36	26-55	1530	41	27-54	1230	44	15-56	1100	52
			27-64	1300	32	22-63	1215	38	5-56	1130	37	9-56	1900	47	25-57	1700	55
						26-64	1300	32	3-57	1400	36	18-56	1900	54	25-58	1600	60
						29-65	1600	32	27-59	1530	44	31-56	1830	54	22-59	1900	54
									26-60	1730	42	1-57	1300	51	2-60	1500	56
									30-61	1800	52	28-57	1730	54	27-60	1630	60
									25-62	1100	44	1-58	1230	46	25-63	1030	51
									30-63	1545	50	27-58	1700	58	14-64	0930	60
									28-64	1200	46	21-62	1830	47	28-64	0850	51
									27-65	1700	42	28-63	1400	57	18-65	1030	46
												15-64	1430	52	30-65	0830	48
												25-64	1430	53			
												26-65	1745	33			
July			August			September			October			November			December		
27-49	1200	58	15-49	1230	61	27-49	1600	54	4-50	1350	43	5-50	1400	42	6-49	1730	32
15-50	1500	58	2-50	1125	58	13-50	1600	47	3-52	1400	51	6-51	1630	36	6-50	1500	32
2-52	1300	56	2-51	1130	62	6-51	1500	55	29-52	1530	44	24-58	1130	36	4-51	1430	34
30-52	1400	66	27-52	1100	58	28-51	1230	43	1-53	1700	54	2-60	1500	41	30-52	1130	34
29-53	1500	67	30-55	1400	60	2-53	1130	56	28-53	1700	46	2-61	1500	33	2-53	1200	35
1-54	1300	55	2-56	1500	62	2-54	1600	61	28-54	1300	42	27-62	1230	33	1-54	1530	34
28-54	1530	66	31-56	1300	53	28-54	1600	50	2-56	1300	50	25-63	1130	33	2-57	1700	34
28-55	1430	64	28-57	1400	56	28-55	1330	49	30-56	1500	38	29-65	1625	32	27-58	1630	33
23-57	1400	64	27-58	1800	64	29-58	1200	47	2-57	1300	53				28-59	1530	32
26-60	2000	64	26-59	1330	56	28-59	1600	44	29-57	1400	40				27-62	0915	33
26-62	0955	59	29-60	1730	58	27-60	1730	54	28-58	1730	41				28-63	1400	33
30-63	1300	66	29-61	1500	64	27-61	1500	45	28-59	1400	42				27-65	1635	33
			28-62	1340	54	27-63	1000	52	30-62	1730	41						
			27-63	1000	55	27-65	1635	38	29-63	1030	41						

108. Musselshell River at Harlowton, Mont. (6-1205)

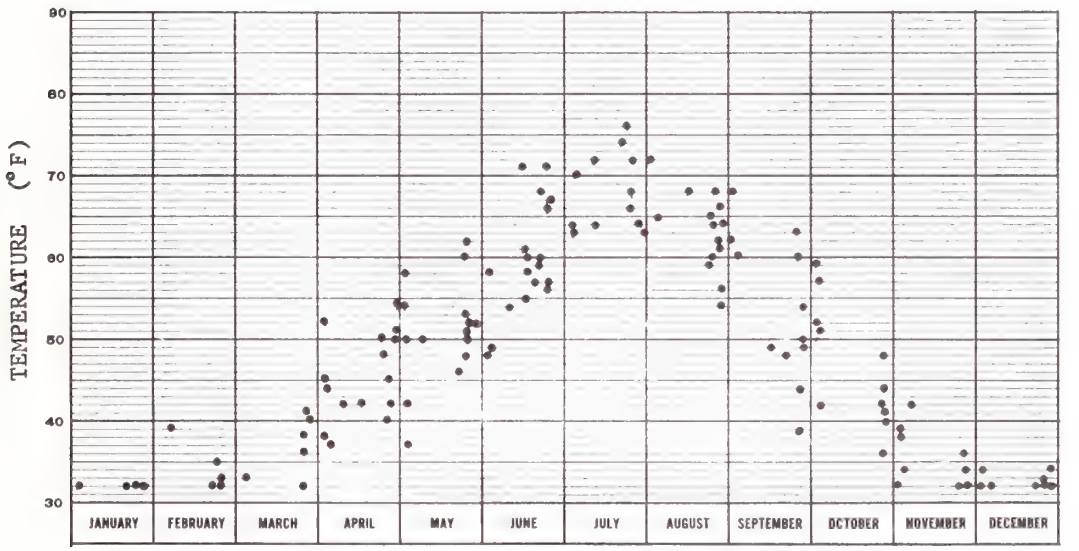
Location.--At gaging station, lat 46°26', long 109°51', in NE¼ sec.28, T.8 N., R.15 E., on left bank 300 ft downstream from bridge on State Highway 19, 1 mile southwest of Harlowton, and 6 miles upstream from American Fork. Altitude of gage is 4,160 ft (by barometer).

Drainage area.--1,125 sq mi.

Water temperature records available.--152 spot observations made at time of discharge measurements during period August 1949 to December 1965, including 8 observations made at time of water quality sampling.

Extremes.--Discharge 1907-65: Maximum observed, 4,530 cfs June 24, 1938; no flow at times.

Water temperatures 1950-65: Maximum observed, 76°F July 25, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperature, 1950-65

108. Musselshell River at Harlowton, Mont. (6-1205)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
22-53	1100	32	23-54	1330	35	26-53	0900	36	12-50	0835	42	3-50	1030	37	1-50	0825	48
4-58	1400	32	24-62	1400	32	27-58	1200	41	3-51	1630	44	1-51	1800	42	15-50	1045	55
29-62	1730	32	5-63	1150	39	29-60	1300	40	30-52	1800	50	26-54	1200	53	9-51	1300	54
3-63	1510	32	25-63	1510	33	6-63	0805	33	29-53	1700	51	9-56	1500	50	2-52	1700	58
29-63	1640	32	26-64	1500	32	26-63	0820	38	28-54	1400	45	29-56	1500	52	3-53	1630	49
27-64	1500	32	23-65	1600	32	25-64	1500	32	26-55	1230	48	2-57	1200	58	23-53	1000	56
26-65	1000	32							5-56	1900	37	27-57	1700	60	1-55	1730	58
									2-57	1530	45	1-58	1630	54	23-55	1300	68
									27-59	1700	48	28-58	1100	62	14-56	1630	71
									27-60	1230	40	27-59	1300	48	18-57	1330	58
									2-61	1300	52	22-62	0830	46	27-57	1400	57
									30-61	1330	54	1-63	0915	50	26-58	1130	60
									25-62	1305	50	27-63	1700	60	23-59	1200	60
									2-63	0805	38	30-63	0950	52	1-60	1830	58
									27-64	1530	48	26-64	0800	50	27-60	1900	66
									15-65	1430	42	27-65	1050	51	23-61	1200	68
									28-65	1005	42				26-62	1415	71
															16-63	1500	61
															24-63	1630	59
															27-64	1530	67
															19-65	1200	57
July			August			September			October			November			December		
12-50	1600	64	15-49	1400	68	28-49	0830	48	3-50	1635	42	3-50	1225	38	7-49	1230	32
5-51	1830	70	3-50	1130	65	14-50	1330	49	3-51	1330	51	5-51	1700	34	1-50	1355	32
1-52	1530	63	1-51	1830	72	5-51	1700	60	2-52	1200	50	24-58	1330	36	3-51	1700	32
31-52	0930	63	26-52	1500	64	1-53	1500	68	28-52	1200	41	2-60	1700	39	2-53	1430	34
28-53	1700	72	29-55	1600	66	29-53	1230	50	28-53	1400	48	2-61	1730	32	2-54	1200	32
1-54	1530	64	28-56	1500	61	1-54	1200	62	27-54	1430	42	8-62	1405	42	3-57	1200	32
27-54	1430	72	27-57	1530	60	28-54	1230	50	1-56	1630	52	26-62	1525	34	26-58	1300	32
27-55	1630	72	28-58	1030	62	28-55	1730	50	29-56	1700	36	24-63	1500	32	22-59	1130	32
11-57	1400	72	25-59	1300	65	29-58	1400	49	2-57	1500	59	29-65	1455	32	4-62	1650	32
22-57	1630	74	30-60	1230	64	28-59	1800	44	28-57	1630	44				27-62	1430	33
27-60	1400	68	29-62	0830	54	28-60	1300	54	29-58	1500	40				27-63	1500	32
25-61	1230	76	26-63	1330	68	26-61	1600	48	28-59	1500	44				28-64	1630	32
26-62	1500	66	24-65	1600	59	25-62	1735	60	4-62	1630	57				28-65	0920	34
30-63	1100	64	30-65	1430	56	26-63	1530	63	28-63	1630	44						
						28-65	1010	39									

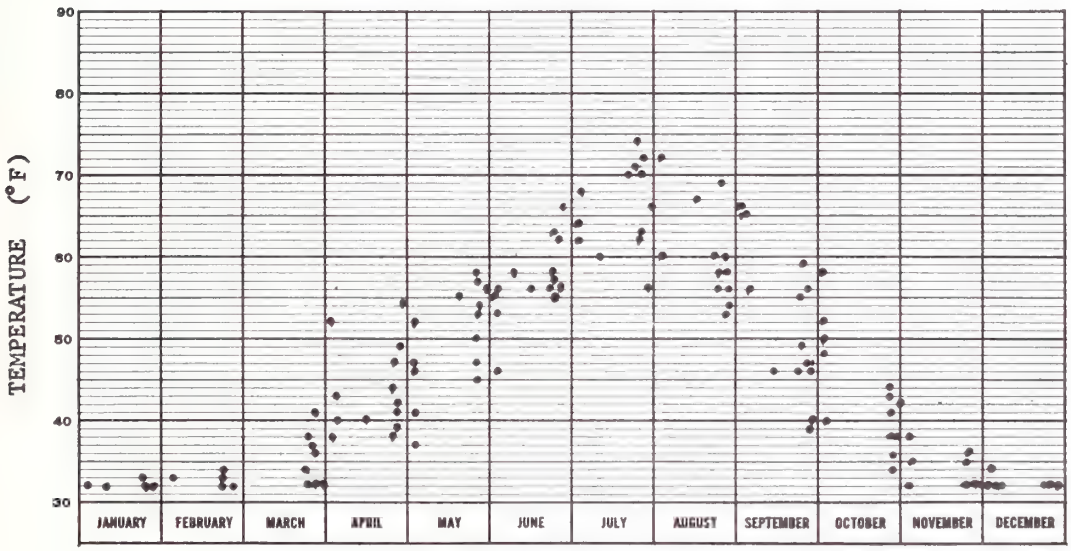
109. American Fork below Lebo Creek, near Harlowton, Mont. (6-1220)

Location.--At gaging station, lat 46°24', long 109°46', in NE¼ sec.6, T.7 N., R.16 E., on left bank 2 miles upstream from mouth, 2 miles downstream from Lebo Creek, and 5 miles southeast of Harlowton. Altitude of gage is 4,170 ft (by barometer).

Drainage area.--166 sq mi.

Water temperature records available.--143 spot observations made at time of discharge measurements during period July 1949 to December 1965.

Extremes.--Discharge 1946-65: Maximum, 956 cfs July 11, 1948; no flow Sept. 13-16, 1960, Aug. 6-8, 1961, Aug. 12, 13, 1964.
Water temperatures 1949-65: Maximum observed, 74°F July 25, 1962; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

109. American Fork below Lebo Creek, near Harlowton, Mont. (6-1220)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-50	1600	32	28-51	1255	32	26-53	1100	37	3-51	1440	43	3-50	1300	37	14-50	1450	56
4-58	1500	32	25-53	1400	32	31-55	1530	32	29-53	1530	49	3-51	0930	41	9-51	1530	58
30-63	0900	32	25-54	0930	34	27-58	1000	36	28-54	1130	39	2-52	1000	47	2-52	1330	56
28-64	1700	32	24-62	1530	32	25-59	1300	34	26-55	1100	44	26-54	1030	50	3-53	1130	46
26-65	0830	33	6-63	1300	33	29-60	1400	41	5-56	0900	40	19-56	1100	55	1-55	1630	55
			25-63	1345	33	27-62	0935	36	2-57	1200	38	31-56	1500	56	23-55	1130	63
			26-64	1700	32	26-63	0920	38	28-59	0930	42	2-57	1030	52	26-56	1230	62
			23-65	1500	32	25-64	1330	32	27-60	1100	38	27-57	1430	58	25-57	1230	55
						30-65	0900	32	2-61	1500	52	2-58	1000	46	26-58	1000	55
									30-61	1130	49	28-58	0930	54	23-59	0930	56
									30-63	1745	54	27-59	1100	45	3-60	1030	53
									27-64	1700	47	27-63	1345	57	28-60	1000	56
									15-65	1400	40	26-64	0930	53	23-61	1000	58
									28-65	0835	41	27-65	0940	47	28-62	1345	66
															16-63	1200	56
															24-63	1430	57
July			August			September			October			November			December		
30-49	0800	56	15-49	1500	67	13-50	1300	46	3-50	1440	40	3-50	1415	38	7-49	1000	32
12-50	1400	60	3-50	1000	60	5-51	1430	56	3-51	1500	50	5-51	1600	35	1-50	1050	32
5-51	1600	68	2-51	1500	72	1-53	1330	65	2-52	1400	52	26-52	0930	32	3-51	1600	32
1-52	1400	62	26-52	1200	58	29-53	1130	46	28-52	1700	43	24-58	1530	36	29-52	1200	32
31-52	1200	66	29-55	1230	60	1-54	1430	66	28-53	1230	44	3-60	1100	38	2-53	1600	34
28-53	1530	72	28-56	1200	56	28-54	1100	47	27-54	1330	38	3-61	1330	32	2-54	1030	32
1-54	1600	64	27-57	1230	58	27-55	1730	49	1-56	1400	48	27-62	1430	35	3-57	1000	32
27-54	1100	63	28-58	0900	58	29-58	1600	47	29-56	1500	34	24-63	1600	32	26-58	1100	32
27-55	1400	70	25-59	1100	60	29-59	1000	40	1-57	1500	58	29-65	1335	32	22-59	1000	32
22-57	1330	70	30-60	1000	54	28-60	1500	56	28-57	1500	43				26-62	1430	32
27-60	1030	62	29-62	1100	53	26-61	1400	46	29-58	1330	36				28-63	1555	32
25-61	1500	74	26-63	1500	69	25-62	1600	56	29-59	0930	38				28-64	1400	32
25-62	1605	71	24-65	1400	56	26-63	1400	59	31-62	1200	42				28-65	1015	34
26-63	1430	62				28-65	0840	39	28-63	1500	41						

110. Musselshell River near Ryegate, Mont. (6-1235)

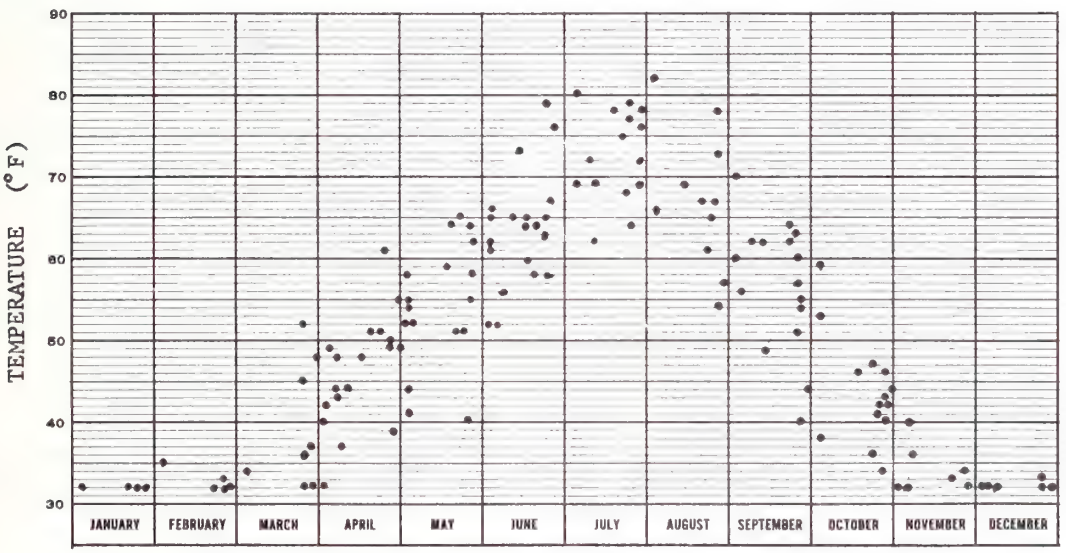
Location.--At gaging station, lat 46°18', long 109°12', in lot 6, NW¼ sec.2, T.6 N., R.20 E., on left bank 1 mile upstream from Careless Creek and 3 miles east of Ryegate. Altitude of gage is 3,580 ft (by barometer).

Drainage area.--1,982 sq mi.

Water temperature records available.--147 spot observations made at time of discharge measurements during period April 1949 to December 1965 including 8 observations made at time of water quality sampling.

Extremes.--Discharge 1946-65: Maximum, 6,260 cfs June 17, 1948; no flow Aug. 17-28, 1946.

Water temperatures 1949-65: Maximum observed, 82°F Aug. 2, 1951; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

110. Musselshell River near Ryegate, Mont. (6-1235)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
22-53	1400	32	25-53	1600	32	26-53	1330	45	7-49	1330	44	3-49	1200	55	2-49	1000	62
3-63	1600	32	23-54	1100	32	24-58	1200	36	11-50	1200	44	3-50	1630	41	14-50	1030	64
28-63	1500	32	24-62	1140	32	31-60	1730	48	3-51	1100	42	29-50	1630	58	9-51	1030	56
27-64	1200	32	5-63	1240	40	26-62	1600	37	7-52	1300	48	3-51	1800	54	25-52	1300	58
25-65	1130	32	25-63	1055	33	6-63	0900	34	30-53	1000	49	2-52	1600	58	2-53	1100	61
			26-64	1230	32	25-63	1520	52	5-54	1600	49	29-52	1430	62	5-53	1630	52
			23-65	1300	32	25-64	1130	32	1-55	1700	32	3-54	1530	44	1-54	1600	52
						29-65	1030	32	7-56	1430	43	17-55	1530	59	13-55	1100	73
									11-57	1100	37	5-56	1600	52	3-56	1600	66
									23-59	1200	51	23-56	1830	65	15-56	1530	65
									29-60	1030	39	2-58	1230	54	17-57	1600	58
									21-61	1230	51	27-59	1000	55	24-58	1300	63
									24-62	1545	61	19-61	1600	64	3-60	1500	65
									2-63	0900	40	22-62	1500	51	28-60	1730	76
									30-63	1040	55	28-62	1130	51	25-62	1500	79
									27-64	1300	50	1-63	1120	52	16-63	0930	60
									15-65	1545	48	27-63	1140	64	24-63	1215	65
									27-65	1230	49	26-65	1300	40	13-64	1600	65
															27-64	1230	67
															19-65	1500	64
July			August			September			October			November			December		
12-49	1100	69	15-49	1800	69	28-49	1100	55	3-50	1030	38	7-50	1630	36	7-49	1630	32
30-49	2030	76	4-50	1030	66	13-50	1030	49	3-51	1730	53	5-51	1200	32	3-51	1330	32
12-50	1030	62	2-51	1730	82	5-51	1100	56	31-52	1700	44	19-56	1130	33	2-54	--	32
5-51	1200	69	20-52	1200	67	27-52	1400	63	29-53	1100	42	3-61	1600	32	26-57	1200	33
29-52	1700	78	26-58	1800	73	2-53	1430	60	27-54	1030	34	8-62	1455	40	4-62	1605	32
28-53	1230	72	24-60	1600	65	3-54	1700	70	26-55	1600	41	26-62	1330	34	26-62	1215	32
7-54	1800	80	28-61	1600	78	30-54	1500	44	17-56	1100	46	29-65	1105	32	27-63	1200	32
30-54	1300	69	28-62	0810	54	27-55	1530	54	23-57	1100	36				28-64	1230	32
19-55	1200	78	26-63	1130	67	10-56	1000	62	29-58	1300	43				27-65	1225	32
11-57	1100	72	24-65	1200	61	25-57	1230	57	26-59	1200	42						
24-57	0930	68	30-65	1230	57	13-60	1215	62	22-60	1100	47						
20-60	1930	75				26-61	1230	51	4-62	1545	59						
25-61	1800	77				24-62	1700	64	27-62	1130	46						
25-62	1400	79				26-63	1200	60	28-63	1330	40						
26-63	1100	64				27-65	1140	40									

111. Big Coulee near Lavina, Mont. (6-1257)

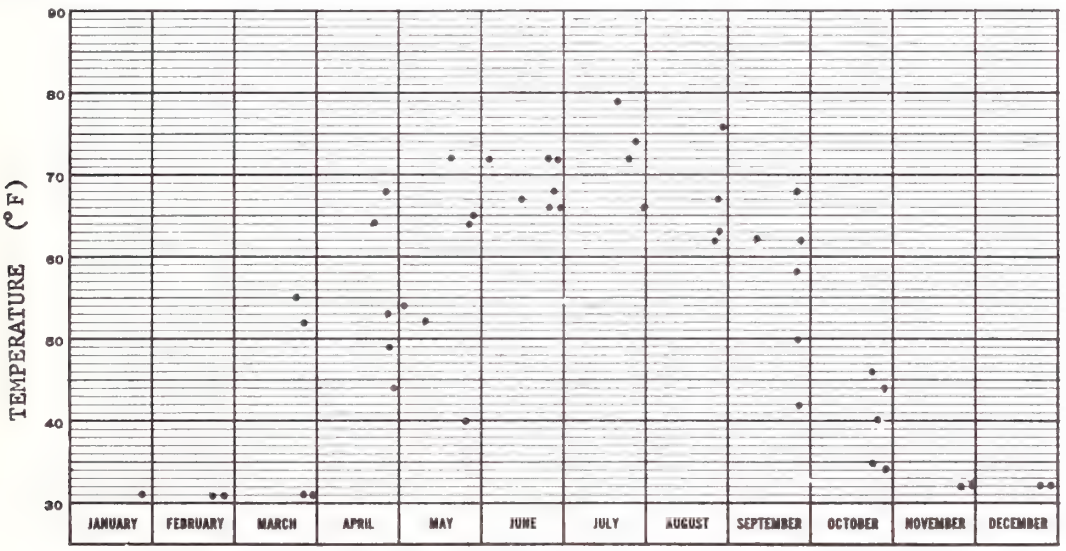
Location.--At gaging station, lat 46°16', long 108°57', in SE¼ sec.15, T.6 N., R.22 E., on left bank 2 miles upstream from mouth and 2 miles southwest of Lavina. Altitude of gage is 3,480 ft (from topographic map).

Drainage area.--232 sq mi.

Water temperature records available.--52 spot observations made at time of discharge measurements during period September 1957 to December 1965.

Extremes.--Discharge 1957-65: Maximum, 250 cfs June 19, 1962; no flow at time in most years.

Water temperatures 1957-65: Maximum observed, 79°F July 20, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1957-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
27-64	1100	32	24-62	0930	32	26-62	1420	52	29-60	1230	44	19-61	1300	72	24-58	1600	72
			20-63	1100	32	22-63	1455	55	21-61	1400	64	1-63	1220	54	3-60	1630	72
			26-64	1100	32	25-64	1000	32	24-62	1420	68	27-63	1005	65	28-60	1950	72
						29-65	0930	32	27-64	1100	53	12-64	1000	52	24-63	1000	66
									27-65	1045	49	25-64	1030	64	15-64	1130	67
												26-65	1030	40	27-64	1000	68
															29-65	1100	66
July			August			September			October			November			December		
20-60	1300	79	24-60	1330	62	25-57	1100	58	23-57	1100	35	24-63	1130	32	26-57	1000	32
26-61	1200	74	28-61	1430	76	13-60	1100	62	26-59	1030	40	29-65	0940	32	26-62	1020	32
25-62	1015	72	27-62	1720	63	26-61	1030	50	21-60	1800	46				27-63	1040	32
30-63	1730	66	26-63	1000	67	24-62	1530	68	29-62	1000	44				28-64	1000	32
						26-63	1030	62	28-63	1100	34				27-65	1040	32
						27-65	1000	42									

112. Musselshell River near Roundup, Mont. (6-1265)

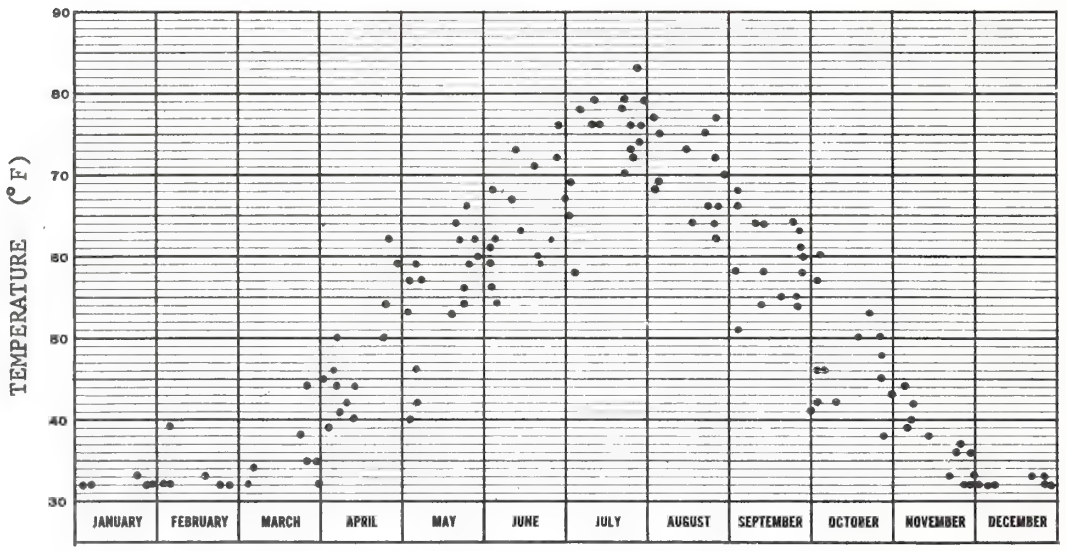
Location.--At gaging station, lat 46°26', long 108°34', in SE¼ sec.22, T.8 N., R.25 E., on left bank just downstream from Half Breed Creek, 2½ miles west of Roundup. Datum of gage is 3,188.22 ft above mean sea level, datum of 1929.

Drainage area.--4,023 sq mi.

Water temperature records available.--158 spot observations made at time of discharge measurements during period April 1949 to December 1965 including 34 spot observations made at time of water quality sampling.

Extremes.--Discharge 1946-65: Maximum, 7,460 cfs June 18, 1948; minimum, 0.6 cfs May 12, 1962.

Water temperatures 1949-65: Maximum observed, 83°F July 26, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

112. Musselshell River near Roundup, Mont. (6-1265)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
23-53	1430	33	25-53	1800	32	24-58	1430	35	7-49	0900	44	2-49	1700	57	1-49	0800	60
26-62	1420	32	23-62	0930	32	21-59	1330	38	10-50	1300	42	4-50	1030	42	12-50	1310	67
3-63	1640	32	5-63	1250	32	6-63	0940	34	7-52	1730	50	6-52	1200	59	24-52	1730	62
7-64	0940	32	5-63	1325	39	25-63	1050	44	5-54	1100	46	29-52	1400	62	4-53	1930	54
30-64	1530	32	18-63	1015	33	3-64	0940	32	12-55	1200	44	3-54	1100	40	1-54	1100	56
6-65	1625	32	4-64	1230	32	30-64	1100	35	7-56	1200	41	17-55	1100	53	13-55	1700	73
27-65	1630	32	24-64	1130	32	31-65	1650	32	11-57	1430	42	24-56	1030	66	2-56	1700	68
			25-65	1700	32				22-61	1530	50	26-59	1430	59	19-57	1300	60
									24-62	1030	62	21-60	1615	62	25-58	1700	70
									2-63	0950	39	19-61	1900	64	18-59	1100	71
									25-63	1210	54	22-62	0955	54	28-60	1600	76
									30-63	1125	60	22-63	1100	56	5-63	1005	62
									1-64	1855	45	1-64	1300	53	19-63	0950	58
									13-65	1000	40	6-64	1405	57	27-63	1230	72
									29-65	1600	59	28-64	1400	60	2-64	0925	59
												8-65	0900	46	13-64	1330	63
															30-64	1000	67
															2-65	0750	61
July			August			September			October			November			December		
10-50	1200	76	15-49	1930	73	28-49	1500	60	10-49	1430	42	13-51	1600	38	8-49	1900	32
29-52	1500	74	14-50	1200	64	12-50	1130	54	2-50	1625	42	23-53	1600	36	27-52	1530	33
30-53	1330	79	19-52	1700	75	13-51	1530	58	29-53	1330	48	8-54	1130	40	9-54	1130	32
7-54	1230	78	25-53	1100	66	26-53	1400	58	1-54	1200	46	19-56	1400	33	27-57	1400	32
19-55	1800	78	2-54	1100	68	3-54	1130	68	26-55	1300	45	24-57	1500	37	5-62	0830	32
12-56	1300	76	26-58	1200	72	27-55	1300	54	17-56	1300	50	24-58	1400	37	29-62	1505	32
30-56	1730	76	23-60	1630	66	10-56	1230	64	30-58	1600	43	8-62	1300	42	4-63	0915	32
11-57	1700	79	24-61	1200	77	25-57	1500	61	26-59	1430	50	29-62	1540	36	30-63	1430	32
24-57	1200	73	27-62	1310	64	26-58	1100	55	22-60	1600	53	5-63	1245	44	30-64	1700	32
24-58	1300	76	6-63	1150	75	12-60	1045	64	26-61	1100	38	27-63	0930	32	1-65	1045	32
19-60	1200	79	29-63	1330	70	19-61	1030	55	4-62	1450	60	4-64	0840	39	21-65	1030	33
26-61	1600	83	4-64	0850	69	24-62	1200	63	2-63	0915	57	29-65	0940	32			
18-62	1220	70	25-64	1200	62	4-63	0920	51	30-63	1700	43	30-65	0940	33			
2-63	1340	58	3-65	0915	72	23-63	1330	64	6-64	1410	46						
25-63	1030	72	26-65	1100	62	1-64	1410	58									
1-65	1030	65				2-65	1515	66									
1-65	1940	69				30-65	0900	41									

113. Musselshell River at Musselshell, Mont. (6-1275)

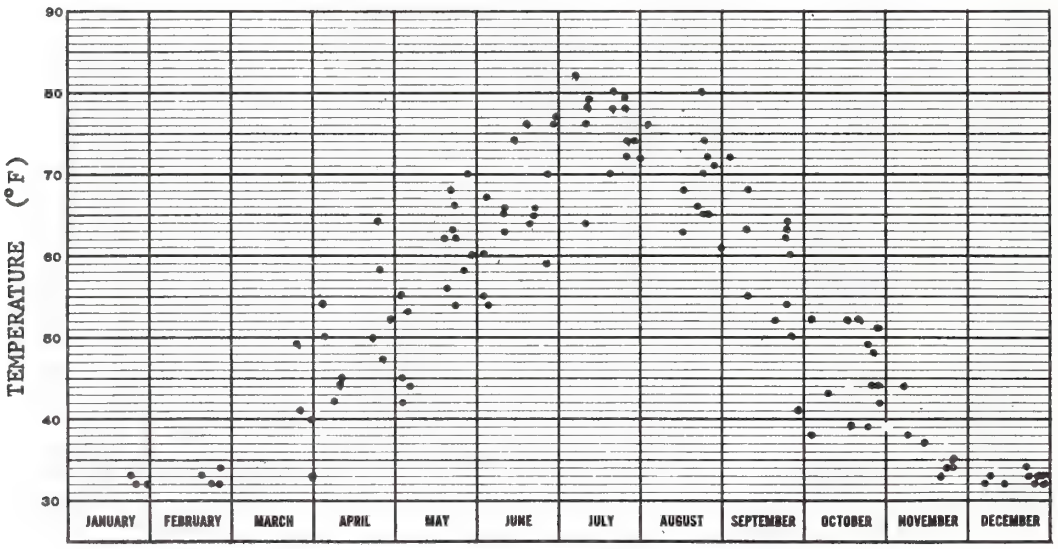
Location.--At gaging station, lat 46°31'20", long 108°06'30", in SW¼SW¼ sec.20, T.9 N., R.29 E., on left bank three-quarters of a mile upstream from Hawk Creek and 1 mile west of Musselshell. Altitude of gage is 2,990 ft (by barometer).

Drainage area.--4,568 sq mi.

Water temperature records available.--127 spot observations made at time of discharge measurements during period May 1949 to December 1965.

Extremes.--Discharge 1928-32, 1945-65: Maximum, 4,790 cfs June 19, 1948; no flow at times.

Water temperatures 1949-65: Maximum observed, 82°F July 7, 1954; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

113. Musselshell River at Musselshell, Mont. (6-1275)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
23-53	1130	33	27-53	1600	34	24-58	1600	41	10-50	1700	44	3-49	0830	53	2-49	1230	60
28-63	1130	32	23-62	1100	32	25-63	1320	49	4-53	1130	54	4-50	1400	44	12-50	1000	65
30-64	1330	32	18-63	1230	33	30-64	1300	40	5-54	1330	50	17-50	1130	62	21-50	0930	65
27-65	1500	32	24-64	1300	32	31-65	1530	33	12-55	1500	49	28-52	1500	62	25-52	1000	59
			25-65	1400	32				5-56	1200	45	22-53	1630	62	5-53	1100	54
									11-57	1600	45	3-54	1300	42	1-54	1400	55
									27-59	1630	57	17-55	1300	56	13-55	1500	74
									22-61	1200	50	5-56	1330	45	2-56	1400	67
									24-62	1200	64	24-56	1400	70	19-57	1630	64
									25-63	1405	58	26-59	1230	58	18-59	1400	76
									8-65	1600	42	21-60	1315	63	28-60	1215	76
									29-65	1500	52	19-61	0800	68	28-62	1300	77
												22-62	1155	54	12-63	1330	66
												22-63	1230	61	27-63	1000	70
												1-64	0900	55	13-64	1000	63
												28-64	1000	60	22-65	1130	66
July			August			September			October			November			December		
12-49	0730	64	16-49	1000	68	12-50	1430	55	10-49	1700	43	7-50	1000	38	8-49	1330	32
31-49	1130	72	14-50	1530	63	13-51	1300	55	31-49	1600	44	13-51	1330	37	13-51	1000	32
10-50	1600	76	31-51	1400	61	27-52	1100	60	2-50	1410	43	8-54	1430	44	27-52	1300	33
29-52	1130	74	25-53	1330	72	26-53	1200	54	17-51	1030	39	19-56	1600	33	9-54	1500	33
30-53	1000	74	2-54	1430	76	3-54	1400	72	29-53	1600	51	24-58	1200	35	21-55	1700	34
7-54	1530	82	25-55	1400	70	27-55	1000	50	1-54	1500	52	26-62	1030	34	26-57	1500	32
19-55	1500	78	26-58	1430	74	10-56	1430	63	26-55	1030	44	23-65	1135	34	29-62	1230	33
12-56	1430	78	23-60	1330	66	25-57	1700	62	17-56	1500	52				30-63	1300	32
12-57	1200	79	24-61	1430	80	12-60	1300	68	29-58	1600	42				30-64	1530	32
24-57	1500	79	27-62	1515	65	19-61	1230	52	26-59	1630	48				21-65	1225	33
19-60	1530	80	29-63	0930	71	24-62	1335	64	22-60	1330	52						
26-61	1700	78	25-64	1500	65	24-63	1530	63	26-61	1230	39						
18-62	1445	70				29-65	1745	41	30-63	1530	44						
25-63	1300	72															
26-65	1000	74															

114. Musselshell River near Mosby, Mont. (6-1276)

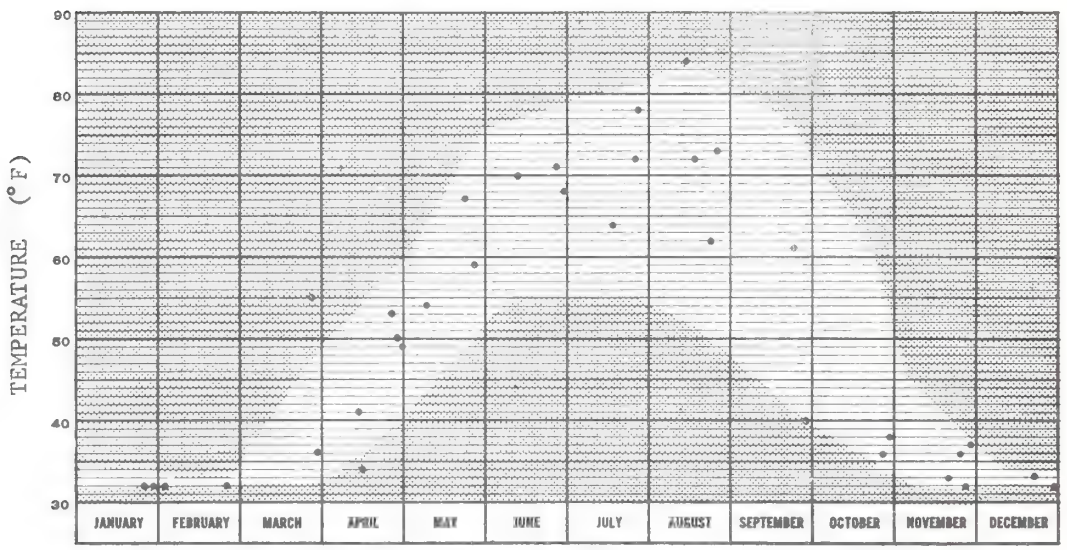
Location.--At gaging station, lat 46°56', long 107°55', in NE¼ sec.4, T.13 N., R.30 E., on left bank three-quarters of a mile upstream from Flatwillow Creek and 5 miles south of Mosby. Altitude of gage is 2,550 ft (from topographic map).

Drainage area.--5,941 sq mi.

Water temperature records available.--34 spot observations made at time of discharge measurements during period October 1962 to December 1965. Once-daily observations November 1962 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1962-65: Maximum, 3,880 cfs June 16, 1965; minimum daily, 5 cfs Jan. 12, 1963.

Water temperatures 1962-65: Maximum observed, 84°F July 14, 1963; minimum, freezing point on many days during winter months.



Spot observations of water temperature, 1962-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1962-65.

114. Musselshell River near Mosby, Mont. (6-1276)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-64	1030	32	4-63	1600	32	27-63	1500	55	26-63	0910	53	22-63	1630	67	13-63	1200	70
27-65	1130	32	24-64	1530	32	30-64	1600	36	15-64	1230	34	12-64	1630	54	26-63	1800	71
									30-64	1600	59	27-64	1600	59	29-64	1500	68
									14-65	1030	41						
									29-65	1200	50						
July			August			September			October			November			December		
16-63	1335	64	28-63	1700	73	24-63	1130	61	24-62	1500	36	29-62	1300	37	30-63	1030	32
25-63	1600	72	26-64	1000	62	29-65	1510	40	30-63	1300	38	26-63	1300	32	30-64	1200	32
26-65	1300	78	17-65	1200	72							19-64	1330	33	21-65	1440	33
												23-65	1430	36			

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max	--	--	--	--	--	--	--	--	--	--	39	33
	Min	--	--	--	--	--	--	--	--	--	--	32	32
1963	Max	32	33	48	60	76	70	75	72	67	60	43	34
	Min	32	32	32	37	41	60	55	60	55	34	32	32
1964	Max	34	33	41	50	64	72	84	74	60	55	45	32
	Min	32	32	32	32	44	55	65	51	45	39	32	32
1965	Max	33	33	33	60	63	80	75	77	60	55	43	33
	Min	32	32	32	32	41	58	64	54	40	42	32	32
Extremes for years 1962-65													
	Max	34	33	48	60	76	80	84	77	67	60	45	34
	Min	32	32	32	32	41	55	55	51	40	34	32	32

115. Flatwillow Creek near Flatwillow, Mont. (6-1279)

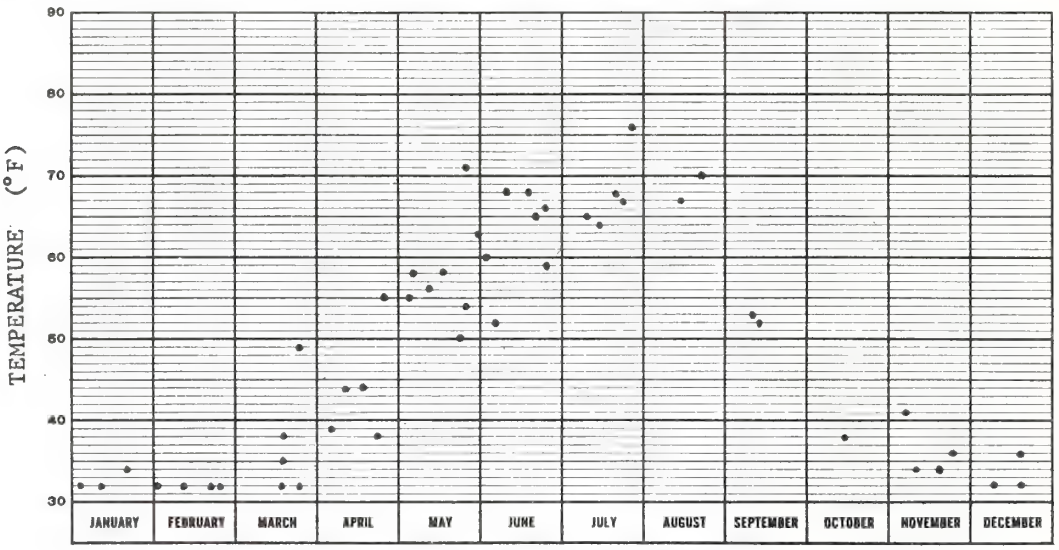
Location.--At gaging station, lat 46°48', long 108°37', in NE¼ sec.19, T.12 N., R.25 E., 10 miles southwest of Flatwillow and 14 miles upstream from Pike Creek. Altitude of gage is 3,560 ft (by barometer).

Drainage area.--188 sq mi.

Water temperature records available.--51 spot observations made at time of discharge measurements during period May 1949 to September 1956.

Extremes.--Discharge 1911-32, 1934-56: Maximum observed, 954 cfs June 4-11, 1917; no flow at times.

Water temperatures 1949-56: Maximum observed, 76°F July 29, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-56

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-52	1200	32	1-52	1100	32	26-52	1100	35	28-50	1600	38	3-49	1530	55	2-49	1600	60
2-53	1030	32	29-52	1030	32	28-53	1500	49	5-51	1830	39	25-50	1700	58	12-50	1530	68
24-53	1130	34	28-53	1530	32	26-54	1100	33	29-52	1530	55	7-51	1600	58	24-52	1100	59
			18-54	1100	32	28-55	1100	32	22-54	1000	44	28-52	1030	54	4-53	1230	52
						26-56	1100	38	25-55	1100	44	23-53	1200	56	24-54	1100	66
												31-53	1700	63	21-55	1130	68
												25-54	1030	58	22-56	1100	65
												27-55	1130	50			
												24-56	1600	71			
July			August			September			October			November			December		
11-50	1000	64	14-50	1730	67	12-50	1630	53	16-51	1430	38	6-50	1630	41	12-50	1030	32
8-52	1230	65	25-53	1600	70	13-51	1000	52				14-51	1430	34	12-51	1500	32
29-53	1700	76										23-53	1430	34	22-54	1130	32
23-54	1030	67										26-54	1030	36	22-55	1000	36
21-55	1100	68															

116. Box Elder Creek near Winnett, Mont. (6-1290)

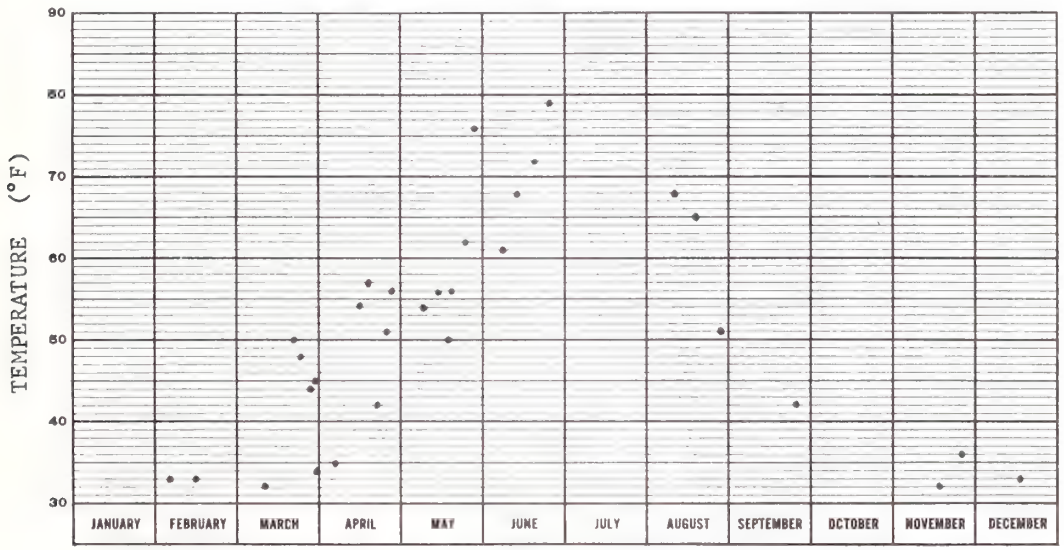
Location.--At gaging station, lat 47°01', long 108°10', in SW¼ sec.34, T.15 N., R.28 E., on right bank 500 ft upstream from bridge on State Highway 20, a quarter of a mile upstream from McDonald Creek, 7 miles upstream from mouth, and 8 miles east of Winnett. Altitude of gage is 2,720 ft (by barometer).

Drainage area.--684 sq mi.

Water temperature records available.--31 spot observations made at time of discharge measurements during period March 1959 to December 1965.

Extremes.--Discharge 1930-38, 1958-65: Maximum, 9,910 cfs June 16, 1962; no flow for many days in each year.

Water temperatures 1959-65: Maximum observed, 79°F June 28, 1962; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1959-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			5-63	1030	33	30-59	1330	44	27-60	1245	42	30-60	1555	76	28-62	1610	79
			18-63	1515	33	29-60	1245	48	20-61	1420	54	21-62	1400	56	13-63	0800	68
						28-63	0920	50	25-63	1700	57	22-62	1420	50	9-65	1830	61
						31-64	1200	45	30-64	1200	56	23-63	0800	56	23-65	1200	72
						10-65	1630	32	8-65	1245	35	12-64	1300	54			
						31-65	1330	34	29-65	0805	51	27-64	1200	62			
July			August			September			October			November			December		
			30-62	1710	51	29-65	1130	42				29-62	1020	36	22-65	0845	33
			26-64	1400	65							24-65	0910	32			
			18-65	0930	68												

117. Flatwillow Creek near Mosby, Mont. (6-1300)

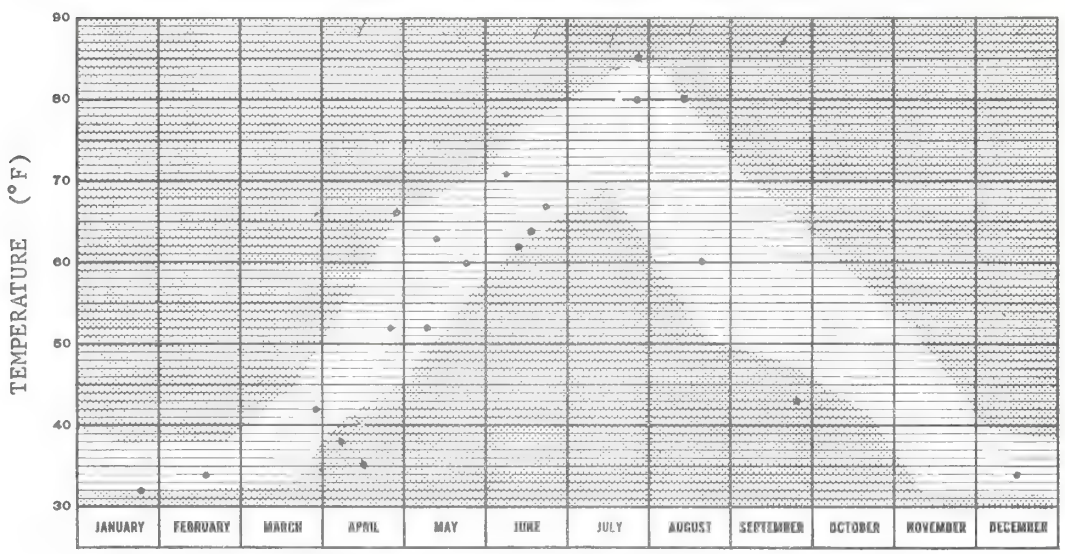
Location.--At gaging station, lat 46°55'40", long 107°56'00", in NW¼SW¼ sec.33, T.14 N., R.30 E., on upstream handrail of county bridge, 0.2 mile upstream from mouth, and 5 miles south of Mosby. Datum of gage is 2,548.26 ft above mean sea level (Bureau of Reclamation bench mark).

Drainage area.--1,855 sq mi.

Water temperature records available.--19 spot observations made at time of discharge measurements during period March 1964 to December 1965. Once-daily observations March 1964 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1964-65: Maximum, 3,580 cfs June 20, 1964; minimum daily, 0.5 cfs Mar. 24, 1964.

Water temperatures 1964-65: Maximum observed, 85°F July 26, 27, 1965; minimum, freezing point on many days during winter months.



Spot observations of waterttemperatures, 1964-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1964-65.

117. Flatwillow Creek near Mosby, Mont. (6-1300)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
27-65	1000	32	25-65	1200	34	30-64	1700	42	15-64	1430	35	12-64	1900	52	12-64	1100	62
									30-64	1630	66	14-64	1200	63	19-64	1215	64
									7-65	1930	38	27-64	1700	60	9-65	1500	71
									29-65	1000	52				23-65	1530	67
July			August			September			October			November			December		
26-65	1400	80	26-64	0830	60	29-65	1410	43							21-65	1555	34
			17-65	1300	80												

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1964	Max	--	--	45	58	70	74	84	78	65	59	47	36
	Min	--	--	33	39	46	59	70	51	49	41	32	32
1965	Max	38	38	41	67	71	77	85	84	71	62	53	40
	Min	32	32	34	39	46	59	71	59	47	49	39	32

Extremes for years 1964-65

	Max	38	38	45	67	71	77	85	84	71	62	53	40
	Min	32	32	33	39	46	59	70	51	47	41	32	32

118. Musselshell River at Mosby, Mont. (6-1305)

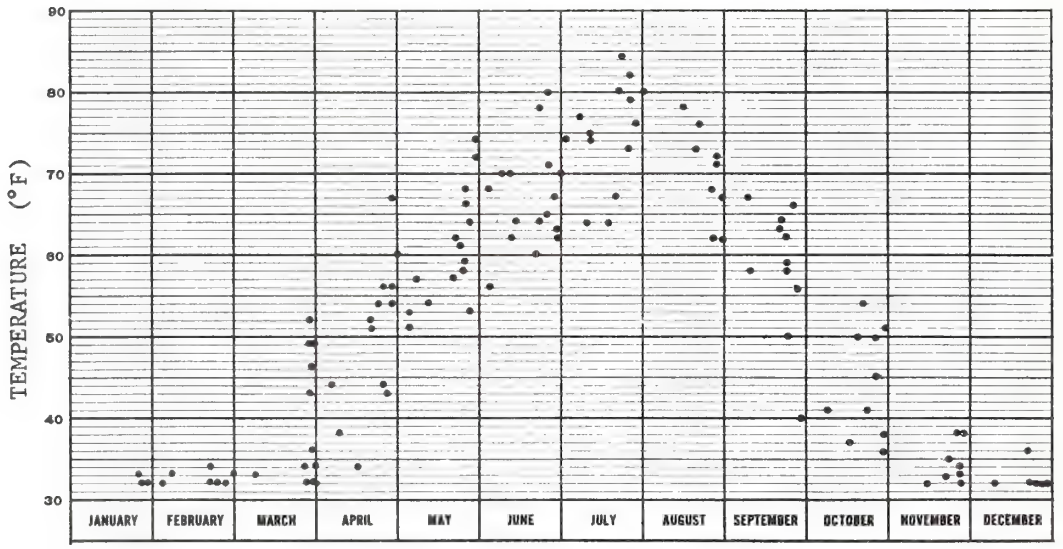
Location.--At gaging station, lat 46°59'40", long 107°53'20", in NW¼NW¼ sec.11, T.14 N., R.30 E., near center of downstream side of bridge on State Highway 20, half a mile west of Mosby, 6 miles downstream from Flatwillow Creek, and at mile 60.0. Altitude of gage is 2,500 ft (by barometer).

Drainage area.--7,846 sq mi.

Water temperature records available.--128 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1929-32, 1934-65: Maximum, 18,000 cfs June 18, 1944; no flow at times.

Water temperatures 1949-65: Maximum observed, 84°F July 22, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.

118. Musselshell River at Mosby, Mont. (6-1305)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
24-53	1400	33	28-53	1030	33	26-54	1430	39	6-49	1730	44	4-49	1200	53	3-49	1200	56
30-64	0900	32	18-54	1530	32	28-55	1500	32	29-52	1230	56	8-51	1130	57	13-50	0930	64
27-65	0930	32	23-62	1600	32	26-56	1530	49	22-54	1330	51	28-52	1530	64	24-52	1330	65
			4-63	1300	32	29-58	1130	43	23-56	1300	54	23-53	0930	57	24-54	1600	80
			7-63	1400	33	30-59	1530	46	29-57	1400	67	25-54	1500	68	21-55	1630	78
			19-63	1000	34	29-60	1600	49	29-58	1330	54	27-55	1600	58	3-56	1200	68
			25-64	0930	32	30-62	1000	36	27-60	1100	43	25-56	1130	66	22-56	1530	66
						27-63	1345	52	20-61	1550	52	30-57	1600	74	29-59	1200	63
						31-64	1000	34	26-61	1200	44	6-59	1110	51	28-60	1000	67
						10-65	1300	33	26-62	1610	56	27-59	1530	53	29-62	1940	70
						31-65	1200	32	26-63	1100	56	30-60	1300	72	13-63	1000	70
									15-64	1130	34	20-61	0930	62	26-63	1600	71
									30-64	1430	60	23-63	1000	61	12-64	1400	62
									8-65	1010	38	12-64	1500	54	29-64	1130	62
												27-64	1430	59	9-65	1640	70
															23-65	0930	64
July			August			September			October			November			December		
11-49	1400	64	15-50	1530	78	21-50	1400	63	11-49	1030	41	14-51	1100	32	12-51	1200	32
31-49	1500	80	19-52	1300	76	12-51	1630	58	16-51	1130	37	23-53	1200	35	22-54	1600	32
11-50	1600	74	26-53	1100	68	23-53	1230	62	30-53	1030	51	26-54	1430	38	22-55	1430	36
8-52	1730	77	26-54	1400	68	23-54	1430	64	21-54	1500	54	20-56	1100	33	27-57	1100	32
29-53	1200	76	30-57	1100	62	26-55	1500	56	25-55	1430	50	25-58	1700	33	28-62	1700	32
21-55	1430	80	28-58	1230	71	11-56	0900	67	18-56	1000	50	26-60	1500	34	30-63	0800	32
1-57	1500	74	30-60	1140	67	26-57	0900	56	22-57	1230	41	29-62	1130	38	30-64	1000	32
12-57	0900	75	28-63	1500	72	24-58	1030	50	27-59	1200	45	26-63	1130	32	22-65	1100	32
25-57	1200	79	26-64	1200	62	24-60	1200	58	30-60	1100	36						
22-60	1300	84	17-65	1730	73	27-62	1400	66	30-63	1200	38						
19-62	0935	67				24-63	0930	59									
16-63	1410	64				29-65	1300	40									
25-63	1730	73															
26-65	1430	82															

119. Sand Creek near Jordan, Mont. (6-1307)

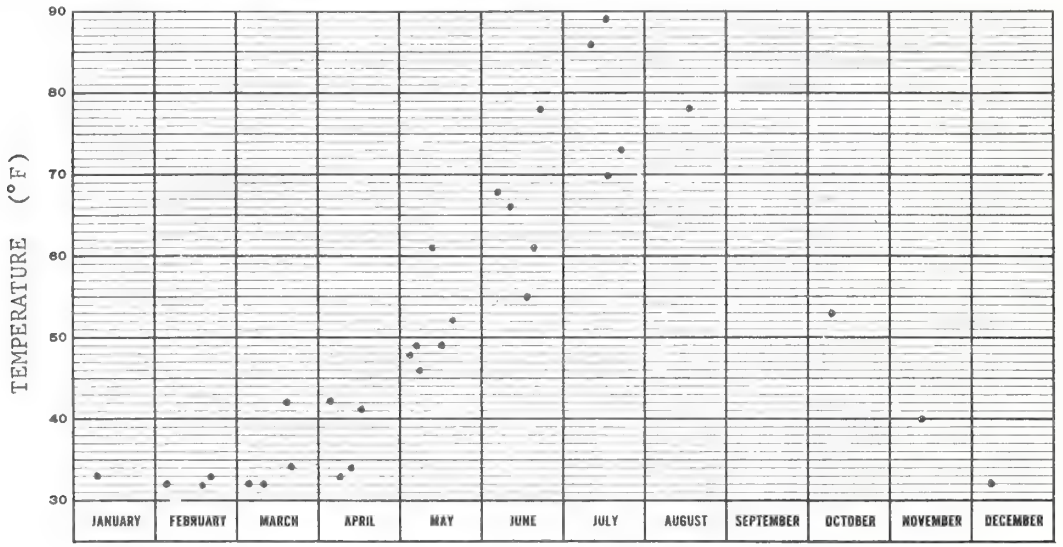
Location.--At gaging station, lat 47°15'10", long 106°50'55", in NW¼NW¼ sec.11, T.17 N., R.38 E., on right bank 200 ft upstream from highway bridge, 5 miles southeast of Jordan, and 7 miles upstream from mouth. Datum of gage is 2,586.28 ft above mean sea level, datum of 1929.

Drainage area.--317 sq mi.

Water temperature records available.--31 spot observations made at time of discharge measurements during period May 1960 to December 1965.

Extremes.--Discharge 1957-65: Maximum, 4,410 cfs Mar. 17, 1959; no flow for many days in each year.

Water temperatures 1960-65: Maximum observed, 89°F July 13, 1964; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1960-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-63	1430	33	19-62	1630	32	3-61	0825	32	3-62	1515	42	3-60	0930	48	5-63	0925	68
			6-63	1030	32	22-62	1500	34	10-63	0930	41	16-62	0940	49	7-63	0825	66
			20-65	1145	33	20-63	0935	42	4-65	1115	33	23-62	0800	52	18-64	1630	55
						10-65	1110	32	7-65	1320	34	8-63	1430	61	19-64	1500	61
												4-64	1200	46	24-64	1600	78
												4-65	1240	49			
July			August			September			October			November			December		
18-62	1855	73	15-62	1000	78				7-65	1115	53	7-62	0945	40	5-62	0910	32
10-63	1230	86															
13-64	1530	89															
13-65	1315	70															

120. Dry Creek near Van Norman, Mont. (6-1310)

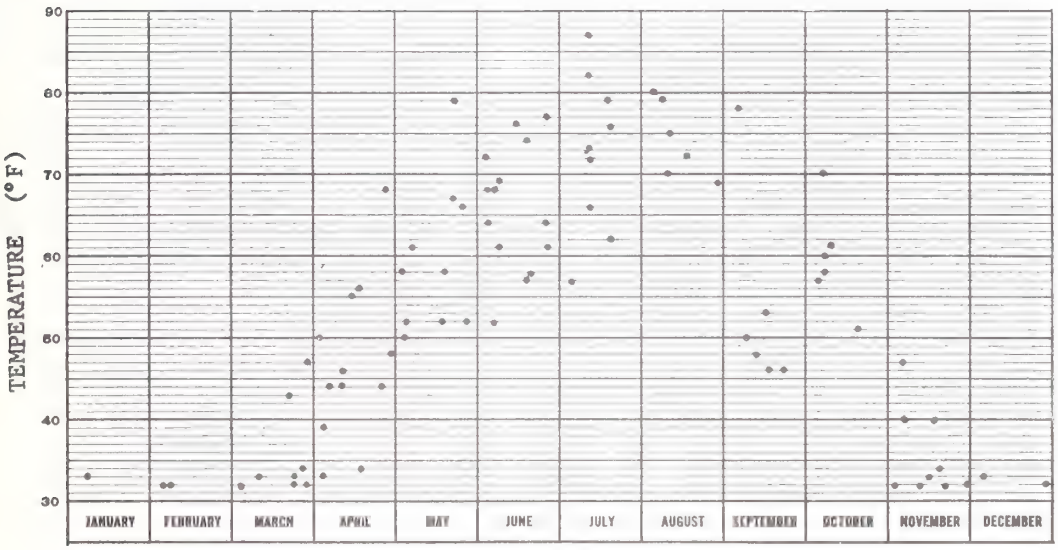
Location.--At gaging station, lat 47°21', long 106°22', in NW¼ sec.3, T.18 N., R.42 E., on left bank 500 ft downstream from Little Dry Creek, 3-3/4 miles northeast of Van Norman Post Office, and 26 miles east of Jordan. Altitude of gage is 2,330 ft (by barometer).

Drainage area.--2,554 sq mi.

Water temperature records available.--93 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1939-65: Maximum, 24,600 cfs Mar. 21, 1947; no flow at times in each year.

Water temperatures 1949-65: Maximum observed, 87°F July 13, 1964; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.

120. Dry Creek near Van Norman, Mont. (6-1310)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-63	1200	33	9-54	1000	32	2-54	1300	32	6-49	1330	44	4-49	1600	52	3-49	1900	68
			19-62	1430	32	23-54	0930	33	3-52	1630	39	18-50	1100	58	25-52	1145	61
			5-63	1530	32	3-58	1415	32	12-52	1630	46	28-52	0900	52	25-53	1520	64
			6-63	1440	32	26-58	1430	34	29-53	1330	48	26-53	1400	66	4-54	1030	64
						2-61	1630	32	14-54	1735	55	2-60	1730	58	14-61	1000	76
						3-61	1035	32	26-57	0910	44	16-62	1230	52	7-62	1255	61
						30-61	1240	47	3-62	1300	50	23-62	1230	67	5-63	1130	68
						22-62	1250	32	25-62	1230	68	8-63	1145	61	5-63	1200	68
						20-63	1030	43	10-63	1100	44	20-64	1600	79	7-63	1030	69
						30-64	1100	32	15-64	1100	56	4-65	1545	50	3-64	1130	72
						10-65	1435	33	4-65	1340	33				17-64	1100	74
									17-65	1110	34				18-64	2000	57
															19-64	1200	58
															24-64	1350	77
															7-65	1100	52
July			August			September			October			November			December		
13-50	1400	82	30-51	1600	69	14-50	1800	53	11-50	1420	61	15-50	1630	33	30-53	1120	32
17-52	1045	79	12-52	1115	75	11-61	1550	50	4-51	1400	57	13-51	1530	32	31-57	1015	32
2-54	1000	57	9-55	1300	79	12-61	1200	48	18-61	1520	51	17-53	1040	40	5-62	1105	33
18-58	1830	62	15-62	1145	72	13-61	0900	48	9-62	1400	60	5-54	1330	47			
11-62	1300	73	7-63	0845	70	22-61	0900	46	9-63	0940	70	20-57	1420	32			
18-62	1640	76	4-65	1355	80	5-63	1410	78	7-65	1315	58	2-61	1320	32			
10-63	1000	72				16-65	1400	46				29-61	1545	32			
13-64	1310	87										7-62	1215	40			
13-65	1125	66										18-65	1530	34			

121. Missouri River at Fort Peck Dam, Mont.

Location.--Lat 48°00'26", long 106°23'49", in sec.14, T.26 N., R.41 E., at lower end of No. 1 tunnel in dam on Missouri River at Fort Peck, 2 miles downstream from Bear Creek, 9½ miles southwest of Nashua, 9½ miles upstream from Milk River, and at mile 1,771.6. Altitude is 2,030 ft.

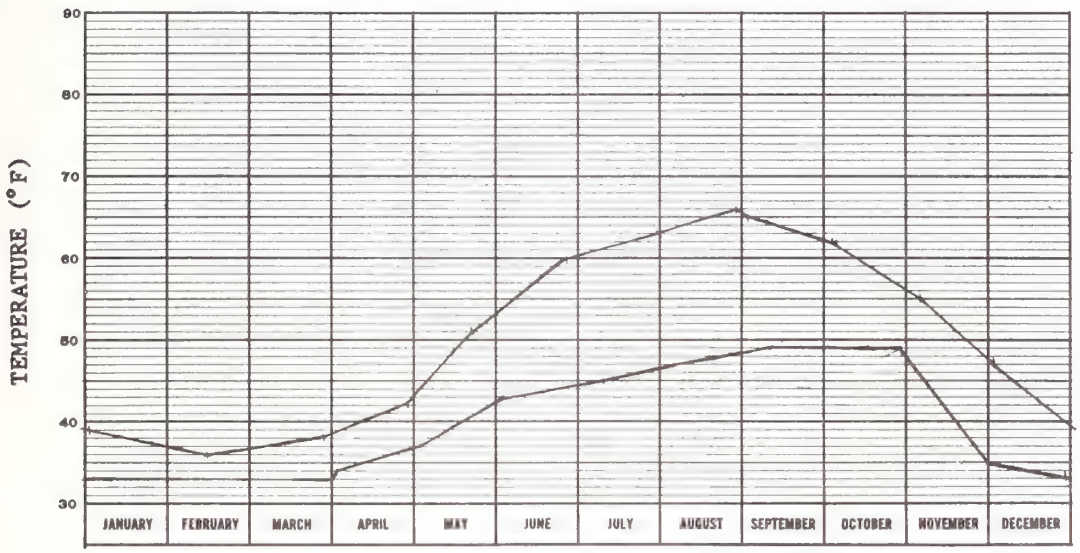
Drainage area.--57,500 sq mi.

Water temperature records available.--Once-daily observations during period January, February 1946, July 1946 to December 1965 published in this report.

Extremes.--Water temperatures 1946-65: Maximum observed, 66°F Aug. 29, 1956; minimum observed, 33°F on many days during winter months.

Remarks.--Daily temperature readings taken at lower end of Tunnel No. 1 just upstream from "Y" branch and before water enters turbines. Tunnel extends 5,500 ft upstream through dam to water in reservoir.

Cooperation.--Data furnished by Corps of Engineers.



The lines connect the highest and lowest monthly temperatures from once-daily observations, 1946-65

MISSOURI RIVER MAIN STEM

121. Missouri River at Fort Peck Dam, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1946																																
January	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	37	37	36	36	36	36	36	36	36	36	36	36	36	36	36
February	36	36	36	36	36	36	36	36	36	36	36	35	35	35	36	36	36	36	36	36	--	--	--	--	--	--	--	--	-	-	-	36
March																																
April																																
May																																
June																																
July	49	49	49	49	49	49	49	49	49	52	52	52	50	52	50	50	50	50	51	51	51	51	50	50	51	51	50	51	51	51	51	50
August	52	51	51	51	52	51	53	57	55	55	54	53	53	53	53	53	55	57	56	56	56	55	55	55	54	54	54	55	55	54	54	54
September	54	54	54	55	56	56	55	54	54	54	55	54	54	55	55	55	55	55	58	57	59	58	59	58	58	58	59	58	58	58	-	56
October	58	58	58	58	58	57	57	57	56	55	55	55	55	54	55	54	54	53	53	53	53	53	53	53	53	52	52	51	51	50	50	54
November	50	50	50	49	48	47	47	47	47	47	47	47	47	47	47	46	46	46	46	46	46	43	43	42	42	42	42	41	41	41	-	46
December	41	41	40	40	40	40	40	40	40	40	40	39	39	38	37	38	38	37	37	36	36	37	37	35	35	35	36	36	35	35	34	38
Water temperatures (°F), calendar year 1947																																
January	34	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	36	35	35	35	35
February	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	-	-	-	35
March	35	35	35	35	35	35	35	35	35	35	35	36	36	36	36	36	36	36	35	35	35	35	35	35	35	35	35	35	35	36	35	36
April	35	35	35	35	35	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	37	37	36	36	37	37	37	37	37	38	-	36
May	38	38	39	39	39	39	39	39	39	39	--	--	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	43	43	43	--
June	43	43	44	44	44	44	44	44	44	44	43	44	44	44	44	44	44	44	45	44	44	44	45	45	45	46	46	45	45	46	-	44
July	46	46	46	47	47	47	47	47	47	45	45	45	46	47	48	46	46	48	46	46	47	48	46	47	46	46	47	47	46	46	48	47
August	47	47	47	47	47	47	47	47	47	47	47	48	51	49	48	48	48	48	48	48	48	48	48	50	51	50	50	50	50	50	50	48
September	50	50	50	50	50	50	51	50	50	51	51	51	51	51	54	53	53	51	51	51	51	51	53	52	51	51	51	51	51	52	-	51
October	52	52	54	52	53	53	53	52	53	53	53	53	53	53	54	54	54	54	54	54	54	53	53	53	53	53	53	53	53	52	53	53
November	53	53	52	52	52	52	52	50	50	49	49	49	49	48	47	47	47	47	45	45	45	45	45	44	44	43	43	43	43	43	-	48
December	43	42	42	42	42	42	42	42	42	40	40	40	40	40	39	39	39	39	39	39	38	38	38	37	37	37	37	37	37	37	36	39
Water temperatures (°F), calendar year 1948																																
January	36	36	36	36	36	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	34	34	34	35	34	34	34	34	34	35
February	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	35	-	-	34
March	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
April	35	35	35	35	35	36	36	36	36	36	--	36	36	36	36	36	36	36	36	37	37	37	37	37	37	37	38	39	40	39	-	36
May	39	39	39	39	39	40	41	41	40	40	40	40	41	41	41	41	43	43	43	43	43	44	44	44	44	43	43	42	43	44	44	42
June	43	43	43	44	44	44	44	44	43	43	44	46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July																																
August	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	48	49	49	49	49	49	--	49	48	49	49	49	49	49	49	49	--
September	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	50	50	50	49	50	50	50	50	50	50	50	50	50	50	50	-	49
October	51	51	51	50	50	50	55	52	53	53	53	53	53	52	52	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	52
November	52	54	53	53	53	51	50	50	50	49	48	48	48	48	48	48	47	47	46	46	46	46	46	46	46	46	44	44	44	44	-	48
December	44	43	43	43	42	42	42	41	40	40	40	39	39	39	39	38	37	37	37	37	35	35	37	35	35	35	34	34	34	34	34	38

121. Missouri River at Fort Peck Dam, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1949																																
January.....	34	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	36	36	36	35
February.....	36	36	36	35	36	36	36	36	36	36	36	36	36	36	36	35	35	35	35	35	35	35	35	35	36	36	36	36	-	-	-	36
March.....	36	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
April.....	36	36	36	36	36	37	36	36	36	36	36	36	36	36	36	36	36	37	37	37	37	37	37	37	37	38	38	40	39	39	-	37
May.....	39	40	40	40	40	41	41	41	41	41	41	42	41	41	41	42	41	41	41	41	41	41	42	42	43	43	44	44	44	44	44	42
June.....	44	45	46	47	48	47	47	44	44	44	44	44	46	47	45	45	45	45	45	46	46	45	46	46	48	50	47	47	47	48	-	46
July.....	48	47	46	47	47	46	46	47	48	48	47	47	48	49	49	49	56	54	54	50	52	53	50	53	51	52	52	52	52	51	50	50
August.....	50	51	50	50	50	50	51	52	54	52	52	52	52	52	53	53	51	52	52	52	52	53	55	55	56	57	54	53	52	54	53	52
September....	53	52	53	53	54	53	53	53	53	53	55	54	56	56	56	56	58	59	59	59	59	59	58	58	57	58	58	58	58	58	-	56
October.....	57	58	58	58	58	58	57	57	57	57	56	55	55	55	54	54	54	54	54	53	52	52	52	51	51	50	51	51	50	50	50	54
November.....	50	50	50	49	49	49	49	49	49	49	49	49	48	48	48	48	48	47	47	47	47	46	46	46	45	45	45	45	45	45	-	48
December.....	45	45	45	45	43	43	42	42	41	41	41	40	40	39	39	39	39	38	38	37	37	36	35	35	34	34	34	34	34	33	33	39
Water temperatures (°F), calendar year 1950																																
January.....	33	33	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
February.....	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	-	-	-	34
March.....	34	34	34	34	34	34	34	34	34	34	35	35	34	34	34	34	34	34	34	34	--	--	--	--	--	--	--	--	--	--	--	34
April.....																																--
May.....																																--
June.....	--	--	--	--	--	--	--	43	44	44	44	44	45	45	45	45	45	46	46	46	46	46	46	46	49	46	47	47	47	48	-	46
July.....	47	46	47	47	48	48	47	47	47	48	48	48	52	50	49	50	49	49	49	47	49	50	50	49	48	48	48	49	48	51	50	48
August.....	50	52	51	50	50	50	50	50	50	50	50	50	50	50	50	51	51	50	52	50	50	49	49	49	49	50	50	50	50	51	51	50
September....	50	50	51	50	50	50	52	51	52	52	51	51	51	52	52	52	52	52	52	52	52	52	52	52	51	51	55	57	57	56	-	52
October.....	52	55	56	56	55	56	56	56	56	55	55	55	55	55	55	55	55	55	55	54	54	54	53	53	53	52	52	52	52	52	52	54
November.....	52	52	52	51	51	51	51	50	50	48	47	47	47	46	46	46	46	46	45	45	43	43	42	41	41	40	40	41	41	40	-	46
December.....	40	40	40	38	39	36	37	38	37	37	37	37	37	37	37	36	36	35	35	36	36	35	35	35	35	35	36	35	35	34	35	36
Water temperatures (°F), calendar year 1951																																
January.....	34	33	33	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	34	34	34	34	34	34
February.....	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	-	-	-	34
March.....	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
April.....	35	35	35	35	35	35	35	35	36	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	36	36	-	35
May.....	37	38	38	38	38	38	38	40	40	40	40	40	40	40	41	42	42	42	42	42	42	42	42	42	42	43	44	44	45	46	46	41
June.....	44	45	46	46	44	46	47	44	45	45	45	46	46	45	45	46	46	48	48	45	45	48	48	46	45	46	53	52	50	49	-	46
July.....	48	47	48	48	48	48	48	50	50	52	53	51	50	49	50	50	50	50	50	49	50	50	52	52	50	50	50	50	50	50	51	50
August.....	50	51	51	56	50	51	52	52	51	52	50	53	50	50	51	51	51	52	52	52	52	52	51	51	50	50	51	51	51	51	51	51
September....	51	51	52	53	54	55	54	53	53	56	52	52	53	54	53	54	53	53	52	52	52	52	55	54	55	55	55	55	55	55	-	53
October.....	55	55	55	--	55	55	55	55	55	55	55	55	55	55	55	54	53	53	53	52	52	52	51	51	51	50	50	50	50	50	49	53
November.....	48	47	47	47	46	46	46	46	46	46	46	46	46	45	45	45	45	45	43	43	42	42	42	42	42	41	41	41	41	41	-	44
December.....	41	41	41	41	40	40	40	40	40	40	40	38	38	38	38	3	3	35	35	35	35	35	35	35	35	35	35	35	35	35	35	37

121. Missouri River at Fort Peck Dam, Mont.

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1952																															
January.....	34	34	34	35	35	35	35	35	35	35	35	35	35	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	34
February.....	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	-	-	35
March.....	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
April.....	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	36	36	36	37	37	37	37	36	37	37	37	37	37	37	37	-	36
May.....	37	37	37	37	38	40	40	40	40	40	42	42	40	42	43	42	43	43	43	42	41	41	41	41	42	41	41	41	42	42	42	41
June.....	43	44	44	45	44	45	46	45	46	50	48	46	48	48	48	46	46	51	51	51	48	49	47	47	48	48	49	49	49	48	-	47
July.....	48	49	49	50	50	49	51	52	48	48	48	49	49	50	50	49	49	50	50	50	50	50	51	51	50	50	50	50	51	50	51	50
August.....	50	50	50	53	50	50	52	51	52	52	53	52	52	52	52	52	52	52	52	53	53	51	51	52	53	54	54	54	55	55	56	52
September....	57	57	56	53	53	52	52	52	53	54	54	54	56	58	59	57	56	55	54	55	55	56	55	55	55	56	56	56	56	56	-	55
October.....	56	56	56	56	57	57	56	57	57	56	56	56	56	56	56	55	55	55	54	54	54	55	55	54	54	55	55	53	53	53	53	55
November.....	53	53	53	52	51	51	50	50	50	49	50	50	50	50	49	49	48	49	49	48	47	47	48	47	47	46	46	45	45	44	-	49
December.....	44	43	43	43	43	43	42	41	41	41	41	41	41	41	40	40	40	39	39	39	39	39	39	39	39	39	38	38	38	36	36	40
Water temperatures (°F), calendar year 1953																															
January.....	36	36	36	36	36	36	35	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
February.....	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	-	-	-	35
March.....	35	35	35	35	35	35	35	35	35	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	36	36	36	36	36
April.....	36	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	38	38	38	38	38	-	37
May.....	38	38	39	39	39	39	39	39	39	40	40	40	41	41	42	42	42	42	42	43	42	42	43	43	43	45	45	45	45	45	45	42
June.....	45	46	46	46	45	46	46	46	46	46	46	46	46	46	46	46	46	47	47	47	48	48	48	48	48	48	48	48	48	48	-	47
July.....	49	47	49	49	49	49	49	49	48	48	48	48	49	49	49	49	50	50	49	49	49	49	49	49	49	49	49	49	50	50	50	49
August.....	50	50	50	50	50	50	50	50	50	50	52	51	49	50	50	50	50	50	50	50	50	50	50	52	52	52	52	51	50	50	52	50
September....	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	53	52	52	54	55	57	54	54	53	56	56	56	55	55	55	-	53
October.....	55	55	55	55	55	56	56	55	56	56	56	55	57	56	56	56	56	57	54	54	53	56	56	56	55	55	55	55	55	55	55	55
November.....	55	54	54	53	53	53	52	52	52	52	51	51	51	51	51	51	51	50	50	50	50	49	49	49	48	48	48	48	47	47	-	51
December.....	47	47	46	46	46	45	45	45	45	44	44	44	44	43	43	43	43	42	42	42	41	41	41	40	40	40	40	40	39	39	39	43
Water temperatures (°F), calendar year 1954																															
January.....	39	38	38	38	38	37	37	38	36	37	37	36	36	36	36	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	36
February.....	35	35	36	36	36	36	36	36	36	36	36	36	36	35	35	35	36	36	36	36	36	36	36	36	36	35	35	36	-	-	-	36
March.....	35	36	36	36	36	36	36	36	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
April.....	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	38	38	38	38	38	38	38	38	38	39	39	39	39	39	39	-	37
May.....	38	38	38	38	38	39	39	39	39	40	40	41	40	40	41	42	41	42	42	43	43	42	42	42	42	42	42	42	43	43	43	41
June.....	44	44	45	45	46	46	46	46	47	47	47	48	48	48	48	48	48	50	48	50	50	48	48	49	49	49	49	49	48	49	-	48
July.....	49	50	50	50	50	48	49	50	50	50	50	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	51	51	51	52	53	51
August.....	52	52	52	52	52	52	52	52	54	54	54	53	53	54	53	54	54	54	54	54	54	54	54	54	54	53	53	53	54	55	55	53
September....	57	57	57	55	55	55	55	55	57	57	57	57	57	57	56	57	57	60	60	60	60	60	60	60	60	60	56	58	58	58	-	58
October.....	57	58	57	57	57	57	57	57	57	57	57	57	56	56	56	56	56	56	55	55	55	55	54	54	54	53	53	53	52	52	52	55
November.....	51	51	51	51	50	50	50	50	50	50	50	49	49	49	49	48	48	48	48	48	48	48	47	47	47	47	47	46	46	46	-	49
December.....	45	44	44	44	44	44	44	43	43	42	42	42	42	42	42	42	42	41	40	41	41	41	41	41	41	39	39	39	39	38	38	42

121. Missouri River at Fort Peck Dam, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1955																																
January.....	38	38	37	37	37	37	36	36	36	36	36	36	35	34	35	35	34	34	34	34	34	34	33	33	33	33	33	33	33	33	33	35
February.....	33	33	33	33	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	-	-	-	34
March.....	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	35	35	34
April.....	35	35	35	35	35	35	35	35	35	36	36	36	36	36	36	36	36	37	37	37	38	38	38	38	38	38	38	38	38	39	-	37
May.....	39	40	40	40	40	40	40	42	42	42	42	42	42	42	42	43	43	43	43	44	44	44	44	44	44	44	44	44	44	45	45	42
June.....	45	45	45	47	48	48	48	48	47	48	48	50	50	50	46	46	46	47	50	49	49	49	49	48	49	48	49	49	51	51	-	48
July.....	51	58	52	53	53	53	53	55	54	50	52	55	53	55	56	55	54	54	54	55	55	54	57	57	57	56	56	56	56	58	58	55
August.....	57	57	54	55	58	56	55	59	57	57	59	57	57	59	59	59	58	58	58	58	58	58	56	57	57	59	58	58	60	60	62	58
September....	62	60	60	59	60	59	61	57	59	59	63	64	64	64	64	64	63	63	63	63	63	62	61	60	60	59	59	59	59	59	-	61
October.....	59	58	58	58	58	58	57	57	57	57	57	56	56	55	55	55	55	55	55	55	55	55	54	54	53	53	53	52	52	52	51	55
November.....	51	49	48	48	48	47	48	47	47	46	46	44	43	42	41	40	39	38	38	38	38	38	38	37	36	36	36	36	35	35	-	42
December.....	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
Water temperatures (°F), calendar year 1956																																
January.....	34	34	35	34	34	34	34	34	34	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	34	34	34	34	34	34	34	34
February.....	34	34	34	34	34	34	34	35	35	35	35	35	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	-	-	34
March.....	34	34	34	34	34	34	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	36	36	36	36	35
April.....	36	36	36	36	37	36	36	36	37	37	37	37	37	37	37	38	38	38	38	38	38	38	38	37	38	38	38	38	38	38	-	37
May.....	39	39	39	39	39	39	40	41	40	40	40	41	41	41	41	42	42	43	45	45	45	47	47	47	47	47	48	48	48	48	50	43
June.....	50	51	51	51	50	50	50	52	--	--	50	52	52	53	52	53	54	55	55	56	58	59	60	60	60	59	59	59	59	59	-	53
July.....	60	60	58	58	57	59	58	60	60	60	60	60	60	61	60	60	60	61	60	60	60	60	59	58	59	59	61	62	61	60	63	60
August.....	64	61	60	60	62	63	63	63	63	63	61	60	60	62	62	62	59	61	61	63	65	63	62	62	62	62	62	64	66	64	64	62
September....	65	64	63	64	64	64	64	64	64	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	61	61	61	61	61	-	62
October.....	60	60	60	60	60	60	60	59	59	58	58	58	58	58	57	57	57	57	57	56	56	56	55	55	55	54	54	54	53	52	52	57
November.....	52	51	50	50	50	50	49	49	48	48	47	47	47	46	46	46	46	45	45	44	44	44	44	43	43	43	42	42	42	42	-	46
December.....	42	42	42	40	40	40	39	37	37	36	36	36	35	35	35	35	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	36
Water temperatures (°F), calendar year 1957																																
January.....	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	35	35	33	33	33	33	33	35	34	33	33	33	33	33	33
February.....	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	-	-	-	33
March.....	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	34	34	34	34	34	34	33
April.....	34	35	35	35	35	36	36	36	35	35	35	35	35	36	36	36	36	36	37	37	37	38	38	38	38	38	38	38	39	42	-	37
May.....	42	44	44	44	44	45	45	45	44	44	45	44	44	46	46	46	51	51	50	48	48	48	49	49	48	49	49	50	50	50	48	47
June.....	50	50	52	51	51	51	53	51	50	51	53	52	52	55	55	55	54	54	54	54	54	57	58	56	56	56	57	56	56	56	-	54
July.....	55	55	53	56	59	60	57	54	53	53	53	53	59	53	53	54	55	57	58	54	55	56	56	55	55	56	55	55	58	56	55	55
August.....	55	57	55	56	56	56	60	61	61	54	57	59	60	59	56	60	61	61	63	61	63	61	62	64	61	56	58	62	63	62	64	59
September....	64	64	63	62	62	64	62	61	63	63	64	63	61	63	62	62	61	61	59	60	60	60	60	60	59	59	60	60	59	59	-	61
October.....	60	60	59	58	58	57	57	57	56	56	56	56	56	56	56	56	56	55	55	55	54	53	53	52	52	52	52	51	51	51	51	55
November.....	50	50	50	49	49	48	48	48	48	48	47	47	47	47	47	47	47	46	45	45	45	44	44	44	44	44	43	43	43	43	-	46
December.....	42	42	42	42	42	41	41	41	41	40	40	40	40	40	40	39	39	39	39	39	39	39	39	39	38	38	38	37	36	36	36	39

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Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1958																																
January	36	36	35	35	35	35	35	35	35	35	35	35	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
February	34	34	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	-	-	34
March	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	35	35	35	35	36	36	36	36	36	36	36	35
April	36	36	37	37	37	37	37	37	37	37	37	37	37	37	38	38	38	38	38	39	40	39	39	40	40	40	40	40	40	40	-	38
May	41	41	42	42	42	43	43	43	43	44	44	47	47	47	47	47	46	46	46	47	47	46	47	47	46	47	46	47	47	47	47	45
June	50	49	47	47	48	49	47	47	48	47	48	49	50	50	50	49	51	51	52	51	53	51	52	49	50	51	52	49	50	52	-	50
July	53	52	49	49	50	49	52	51	51	51	51	53	54	58	58	56	55	54	55	52	52	53	53	53	56	56	54	55	55	53	55	53
August	55	53	54	54	57	55	55	54	54	55	54	55	54	55	55	55	56	56	55	56	55	55	55	57	57	56	56	56	57	58	58	55
September	57	57	57	57	56	55	56	55	56	56	55	56	55	60	61	63	63	61	61	61	61	61	59	59	59	59	58	58	58	57	-	58
October	57	57	57	57	57	57	57	57	56	55	55	54	54	54	55	55	55	55	55	55	55	53	53	53	52	52	52	52	52	52	51	55
November	51	51	51	50	50	50	50	50	49	49	49	48	48	47	46	46	46	46	45	45	44	44	44	44	43	42	42	42	41	41	-	46
December	41	41	41	40	39	39	38	38	37	36	36	36	36	36	36	36	36	36	36	36	36	35	35	35	35	35	35	34	35	37	35	37
Water temperatures (°F), calendar year 1959																																
January	35	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
February	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	-	-	-	35
March	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	36	35	35	35	35	35	35	35	35	35	36	35
April	36	36	36	36	36	36	36	36	36	36	36	36	37	37	37	37	37	37	37	37	37	38	38	38	38	38	38	39	39	40	-	37
May	40	40	40	40	41	41	41	41	42	42	42	42	43	44	44	44	46	46	44	45	45	45	45	47	46	45	45	45	45	46	46	43
June	47	47	47	47	46	47	47	48	49	51	50	51	52	51	53	48	50	49	50	50	49	49	50	50	51	51	52	53	54	54	-	50
July	55	54	54	53	55	56	57	57	56	56	56	55	55	53	55	54	54	55	55	55	56	55	56	56	55	55	55	58	60	59	58	56
August	56	55	55	57	57	57	57	56	56	58	56	57	55	57	58	57	57	57	57	57	57	57	58	58	58	58	58	58	58	58	56	57
September	62	61	62	60	61	61	62	61	62	62	62	62	61	61	61	60	60	59	59	59	59	59	59	59	59	58	58	57	56	56	-	60
October	56	56	56	56	56	55	55	54	54	53	52	51	51	51	51	51	51	51	51	50	50	50	50	50	50	50	50	49	49	49	49	52
November	49	49	48	47	46	47	46	45	45	45	45	44	44	43	40	40	40	40	40	39	40	40	40	40	40	40	40	39	39	39	-	43
December	38	39	39	38	38	38	38	37	37	37	37	37	37	37	37	37	37	36	36	36	36	36	36	35	35	35	35	35	35	35	34	37
Water temperatures (°F), calendar year 1960																																
January	34	35	34	33	33	33	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
February	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	33	34	34	34	34	34	-	-	34
March	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	34	34	34	34	35	35	35	35	35	35	35	34
April	35	35	35	36	36	36	36	36	36	36	37	37	37	37	37	37	37	37	37	37	37	38	38	38	38	38	38	38	38	38	-	37
May	38	39	39	39	39	39	40	40	41	41	42	43	45	44	45	45	45	45	45	45	46	46	46	46	46	47	47	47	48	48	49	44
June	48	48	48	48	49	50	49	49	47	47	48	48	48	47	47	48	48	48	50	49	55	52	54	53	53	52	52	52	52	52	-	50
July	53	50	50	52	52	54	53	51	51	51	52	52	52	53	52	52	53	54	53	53	53	53	53	54	54	54	54	54	54	53	54	53
August	53	53	53	53	53	54	54	54	53	53	53	53	53	55	53	53	56	56	55	54	54	55	55	56	55	55	54	58	57	55	56	54
September	56	55	55	56	55	--	56	56	58	56	56	55	55	55	56	55	60	57	56	55	55	54	61	57	58	57	58	57	55	57	-	56
October	56	55	58	58	58	58	58	57	56	57	58	58	57	57	57	57	56	55	55	55	55	55	55	55	55	55	55	54	53	53	52	56
November	52	52	52	51	51	51	50	49	49	48	48	48	47	48	47	45	44	47	47	47	46	46	45	45	45	44	44	44	43	43	-	47
December	42	42	41	41	41	41	41	41	41	40	40	39	40	40	39	39	38	38	38	38	38	38	37	37	37	36	36	36	36	35	35	39

121. Missouri River at Fort Peck Dam, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1961																																
January.....	35	35	35	35	35	35	35	35	34	35	35	35	35	35	35	35	35	35	35	34	35	35	35	35	34	35	35	35	35	35	35	35
February.....	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	35	35	35	36	36	35	35	35	35	35	36	36	-	-	-	35
March.....	36	36	36	36	36	36	35	35	35	35	35	36	36	36	36	36	36	36	36	37	37	38	38	38	38	38	37	37	37	38	38	36
April.....	38	38	38	37	37	37	38	38	38	38	38	39	39	39	39	39	40	40	40	40	40	41	40	40	40	40	40	40	40	40	-	39
May.....	41	42	42	42	43	43	44	44	43	43	43	43	44	44	44	45	45	45	45	45	46	46	46	45	45	46	--	47	49	46	47	44
June.....	46	47	47	48	48	48	48	46	--	48	49	49	49	48	48	47	47	48	48	48	47	49	50	50	49	49	49	49	49	49	-	48
July.....	51	57	--	50	50	51	50	50	50	51	51	50	53	51	51	50	50	50	51	51	50	51	49	50	50	50	51	62	--	--	--	51
August.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50	50	50	50	50	50	51	54	54	54	54	54	54	54	54	--
September....	53	56	60	55	58	58	53	54	54	54	54	53	54	56	59	59	57	59	56	56	57	58	57	59	58	58	57	57	56	56	--	56
October.....	56	56	56	56	56	55	54	54	54	54	54	54	54	54	54	54	53	53	53	53	52	52	52	51	51	51	51	51	49	49	49	53
November.....	49	48	48	47	46	45	45	45	45	45	45	45	45	45	44	44	44	44	43	43	43	43	42	42	41	42	41	41	41	41	-	44
December.....	41	41	39	40	39	39	39	38	37	37	36	36	36	35	35	35	35	34	34	34	34	34	34	34	35	35	34	35	35	34	34	36
Water temperatures (°F), calendar year 1962																																
January.....	35	35	36	35	35	34	35	35	35	35	35	35	35	35	35	35	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	35
February.....	35	36	36	36	35	35	35	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	35	-	-	-	36
March.....	35	35	35	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	37	--	36	--	37	37	37	36	37	37	36
April.....	37	37	37	37	37	37	37	37	37	37	37	37	38	38	38	38	38	39	39	39	39	39	40	40	40	40	40	41	41	41	-	38
May.....	41	42	42	42	42	43	44	43	43	44	44	44	44	44	44	45	45	45	45	48	46	45	46	46	46	46	47	48	48	47	48	45
June.....	47	48	48	50	51	50	51	51	51	52	52	51	51	52	51	51	51	51	50	51	51	52	51	52	53	52	50	52	53	53	-	51
July.....	53	50	51	53	51	52	53	53	51	52	52	51	52	53	52	52	53	54	51	53	54	53	54	52	53	52	52	52	53	55	55	52
August.....	53	53	53	54	54	56	56	54	54	53	54	54	55	53	55	57	55	53	55	56	56	54	55	57	55	54	54	55	56	56	56	55
September....	54	53	53	59	54	54	54	54	57	59	61	59	59	58	58	56	58	55	55	55	55	56	56	55	57	59	60	57	60	60	-	57
October.....	60	60	62	60	58	57	59	59	59	58	58	58	58	57	57	57	57	56	56	56	56	56	55	55	55	55	54	55	54	54	54	57
November.....	54	54	54	53	53	53	52	52	52	52	52	51	51	51	50	50	50	49	49	49	48	48	48	48	48	48	48	47	47	47	-	50
December.....	47	46	46	46	46	46	45	45	45	44	43	43	43	42	42	42	42	42	42	42	43	42	41	41	40	40	40	39	38	38	38	43
Water temperatures (°F), calendar year 1963																																
January.....	38	38	38	37	38	38	38	38	37	37	37	35	35	35	35	35	35	35	35	35	35	34	35	35	35	34	34	35	34	35	35	36
February.....	35	35	35	35	36	36	36	36	36	36	36	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	-	-	-	36
March.....	36	36	36	36	36	36	36	36	36	36	36	36	37	37	37	36	36	36	36	36	37	37	37	37	37	--	37	37	38	38	38	37
April.....	38	38	38	38	38	38	38	38	38	38	38	38	39	39	40	39	39	39	39	39	39	39	39	39	40	41	42	42	41	41	-	39
May.....	41	41	42	42	42	43	43	43	42	44	43	43	43	43	43	43	43	43	43	43	43	44	45	45	46	46	46	45	45	45	46	44
June.....	46	45	45	45	45	46	46	46	46	46	47	50	46	46	45	45	46	46	46	47	47	47	47	48	49	47	48	48	48	48	-	47
July.....	50	50	50	48	48	49	49	50	50	49	49	53	53	53	53	51	53	53	53	50	50	51	50	50	51	51	53	53	51	50	52	51
August.....	52	54	54	52	52	52	52	52	51	52	51	53	53	52	51	51	52	52	53	51	51	52	51	52	51	51	51	52	52	52	52	52
September....	52	51	51	51	52	52	52	52	53	52	52	52	53	53	57	54	52	53	53	53	53	58	54	55	55	55	56	55	55	55	-	53
October.....	54	54	55	55	54	54	54	56	54	54	59	54	54	54	55	56	57	55	53	53	53	56	56	59	58	57	57	57	56	56	56	55
November.....	53	55	55	55	55	55	55	53	53	53	53	52	52	54	51	51	50	50	50	49	48	48	48	47	47	47	47	47	47	47	-	51
December.....	47	46	46	45	45	45	45	44	44	43	43	42	42	40	38	39	38	38	37	36	36	37	36	36	36	36	36	36	36	36	35	40

MISSOURI RIVER MAIN STEM

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Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1964																																
January	35	35	36	35	35	35	35	35	35	35	35	34	34	34	34	35	35	35	36	35	36	35	35	35	35	35	35	35	35	35	35	35
February	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	-	-	35
March	35	35	35	35	35	35	35	35	35	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
April	36	36	36	36	36	36	36	36	36	37	37	37	37	38	38	38	38	38	38	39	39	39	39	39	40	40	39	40	40	41	-	38
May	41	42	42	42	42	41	41	42	42	42	43	43	44	44	45	45	44	46	44	45	45	44	45	45	48	48	48	48	48	47	47	44
June	47	47	46	45	47	46	46	46	45	47	47	49	48	47	48	49	50	47	47	49	50	51	50	50	50	51	51	51	51	51	-	48
July	51	51	47	50	49	49	51	51	50	50	50	49	49	50	51	52	52	52	50	50	51	51	53	53	51	51	50	52	52	51	51	51
August	51	53	54	53	53	52	53	52	52	52	53	52	52	52	52	52	52	52	52	54	53	54	54	53	53	53	54	53	53	53	53	53
September	53	57	56	58	59	56	54	54	54	54	56	56	55	56	56	56	57	55	56	56	56	57	57	58	58	56	57	57	57	57	-	56
October	57	57	57	56	56	56	56	56	56	56	55	55	55	55	55	55	55	55	55	54	54	55	55	54	54	54	53	53	53	53	53	55
November	52	53	52	53	53	52	52	52	51	51	51	51	50	50	50	50	49	48	48	47	47	46	47	47	45	45	45	45	45	44	-	49
December	43	43	42	44	42	41	41	41	42	40	39	39	39	38	38	36	36	34	34	34	34	35	35	35	35	35	35	35	35	35	35	38
Water temperatures (°F), calendar year 1965																																
January	36	36	36	36	36	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
February	36	36	36	36	36	36	36	36	36	36	36	35	35	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	-	-	-	36
March	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
April	36	36/	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	37	36	37	36	36	36	37	37	37	37	37	37	-	36
May	37	38	38	38	38	38	38	38	38	38	38	38	40	41	41	42	41	41	42	42	42	43	43	43	43	42	--	43	44	44	46	41
June	44	44	44	44	44	45	44	45	45	46	47	48	46	46	45	46	47	47	46	45	47	47	49	50	47	47	47	49	49	49	-	46
July	49	47	48	48	47	48	47	47	48	48	48	47	49	50	50	50	49	50	48	49	49	49	49	50	49	49	49	49	49	49	50	49
August	51	50	50	50	50	51	51	51	50	51	50	51	52	53	53	51	50	51	51	50	50	50	51	51	51	53	54	54	50	52	56	51
September	54	52	51	51	52	52	52	52	52	52	53	52	52	52	52	52	52	55	55	55	55	55	54	--	53	53	53	53	53	53	-	53
October	53	54	54	54	54	54	54	54	54	54	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	52	52	52	53
November	52	52	52	52	51	51	51	51	50	50	50	49	49	49	48	48	47	47	47	47	47	47	46	46	46	45	44	44	44	43	-	48
December	43	43	43	43	43	43	43	43	43	43	43	42	42	42	42	41	41	41	41	41	41	40	40	40	39	39	38	37	37	36	36	41

121 . Missouri River at Fort Peck Dam, Mont.

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1946	Max	37	36	--	--	--	--	52	57	59	58	50	41
	Min	35	35	--	--	--	--	49	51	54	50	41	34
1947	Max	36	35	38	38	43	46	48	51	54	54	53	43
	Min	34	35	35	35	38	43	45	47	50	52	43	36
1948	Max	36	35	35	40	44	--	--	--	50	55	54	44
	Min	34	34	35	35	39	43	--	--	49	50	44	34
1949	Max	36	36	36	40	44	50	56	57	59	58	50	45
	Min	34	35	35	36	39	44	46	50	52	50	45	33
1950	Max	34	34	34	--	--	48	51	52	57	56	52	40
	Min	33	34	34	--	--	43	46	49	50	52	40	34
1951	Max	35	34	34	36	46	53	53	56	56	55	48	41
	Min	33	34	34	35	37	44	47	50	51	49	41	35
1952	Max	35	35	35	37	43	51	52	56	59	57	53	44
	Min	34	35	35	35	37	43	48	50	52	53	44	36
1953	Max	36	35	36	38	45	48	50	52	57	57	55	47
	Min	34	35	35	36	38	45	47	49	52	53	47	39
1954	Max	39	36	36	39	43	50	53	55	60	58	51	46
	Min	35	35	35	36	38	44	48	52	55	52	46	38
1955	Max	38	34	35	39	45	51	58	62	64	59	51	35
	Min	33	33	34	35	39	45	50	54	57	51	35	34
1956	Max	35	35	36	38	50	60	63	66	65	60	52	42
	Min	34	34	34	36	39	50	57	59	61	52	42	34
1957	Max	35	33	34	42	51	58	60	64	64	60	50	43
	Min	33	33	33	34	42	50	53	54	59	51	43	36
1958	Max	36	35	36	40	47	53	58	58	63	57	51	41
	Min	34	33	34	36	41	47	49	53	55	51	41	34
1959	Max	35	35	36	40	47	54	60	58	62	56	49	39
	Min	34	34	35	36	40	46	53	55	56	49	39	34
1960	Max	35	34	35	38	49	54	54	58	61	58	52	43
	Min	33	34	34	35	38	47	50	53	54	52	43	35
1961	Max	35	36	38	41	49	50	62	--	60	56	49	41
	Min	34	34	35	37	41	46	49	--	53	49	41	34
1962	Max	36	36	37	41	48	53	55	57	61	62	54	47
	Min	34	35	35	37	41	47	50	53	53	54	47	38
1963	Max	38	36	38	42	46	50	53	54	58	59	55	47
	Min	34	35	36	38	41	45	48	51	51	53	47	35
1964	Max	36	35	36	41	48	51	53	54	59	57	53	44
	Min	34	35	35	36	41	45	47	51	53	53	44	34
1965	Max	36	36	36	37	46	50	50	56	55	54	52	43
	Min	35	35	36	36	37	44	47	50	51	52	43	36
Extremes for years, 1946-65													
	Max	39	36	38	42	51	60	63	66	65	62	55	47
	Min	33	33	33	34	37	43	45	47	49	49	35	33

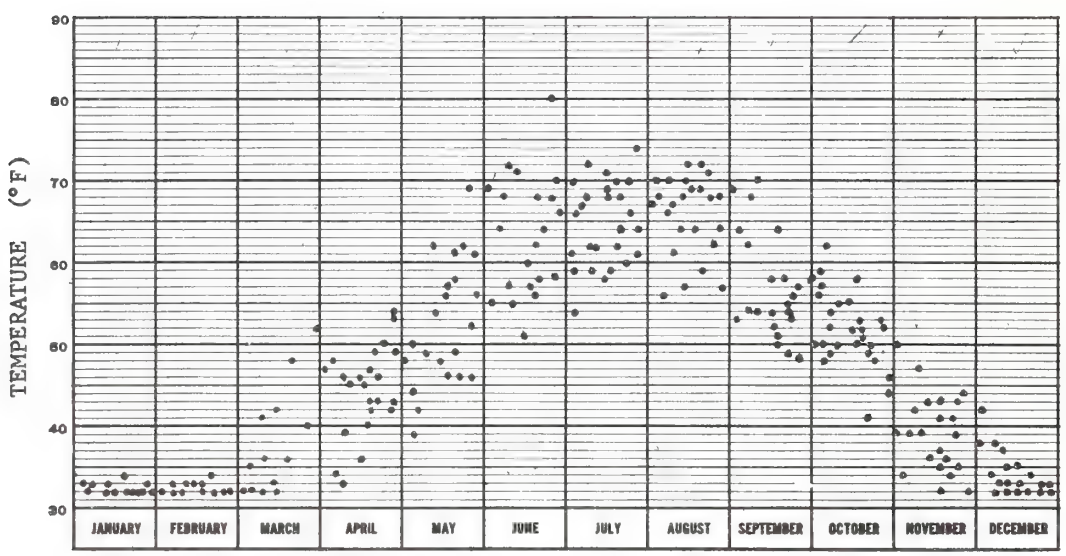
122. Missouri River below Fort Peck Dam, Mont. (6-1320)

Location.--At gaging station, lat 48°02'30", long 106°21'10", in NW¼ sec.6, T.26 N., R.42 E., on right bank about 2 miles upstream from Milk River, 6 miles south of Nashua, 8 miles downstream from Fort Peck Dam, and at mile 1,763.5. Datum of gage is 2,018.00 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Drainage area.--57,556 sq mi.

Water temperature records available.--283 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1934-65: Maximum, 51,000 cfs Aug. 8, 1964; maximum daily reverse flow, 400 cfs Mar. 29, 1943 (backwater from Milk River).
Water temperatures 1949-65: Maximum observed, 80°F June 29, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.

122. Missouri River below Fort Peck Dam, Mont. (6-1320)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
18-61	1000	32	11-54	1610	33	10-54	1610	41	18-49	1130	42	3-49	1030	50	22-49	1400	68
26-61	1135	32	2-61	1505	32	3-61	1320	35	23-49	1030	43	7-49	1130	51	29-50	1830	66
5-62	0800	33	8-61	1140	33	10-61	1305	37	28-49	1130	49	13-49	0830	48	11-51	1300	57
12-62	1115	32	16-61	1125	32	17-61	1540	42	30-51	1700	43	31-49	1000	48	18-51	1400	57
19-62	0945	32	24-61	1215	32	24-61	1215	48	13-53	1415	45	6-50	1500	42	26-51	1100	58
26-62	1130	32	2-62	1105	32	31-61	1310	52	4-60	1555	48	16-50	1200	47	12-52	1415	71
4-63	0825	32	9-62	1545	32	2-62	1500	32	28-60	1245	54	30-50	1100	56	23-52	1815	64
24-63	1530	32	16-62	1545	32	9-62	1200	32	7-61	1315	46	16-51	1600	50	3-60	1300	55
31-63	1600	32	23-62	1600	32	16-62	1645	32	14-61	1205	37	22-51	1200	57	9-60	1500	64
3-64	0830	33	8-63	1500	32	15-63	1045	33	20-61	1145	49	7-52	1330	59	17-60	1250	62
10-64	1400	32	21-63	1340	32	29-63	1130	40	28-61	0920	42	25-52	1430	61	22-60	1615	58
17-64	1500	34	13-64	1615	33	20-64	1340	36	2-62	1200	47	6-60	1245	49	30-60	1235	70
30-64	1520	33	20-64	1550	34	3-65	1630	32	9-62	1140	39	12-60	1630	62	1-61	1605	69
11-65	1300	33	16-65	1330	33				16-62	1515	45	19-60	1620	55	9-61	1145	68
									17-62	0815	42	27-60	1205	62	16-61	1435	60
									18-62	1115	43	4-61	1540	44	29-61	1320	80
									23-62	1310	50	12-61	1240	54	4-62	0815	55
									30-62	1050	53	18-61	1520	56	11-62	1600	72
									5-63	1015	34	19-61	1555	58	18-62	0820	56
									15-63	1010	46	26-61	1215	69	26-62	1145	68
									9-64	1600	33	7-62	1145	49	7-63	1350	60
									17-64	1030	40	14-62	1830	48	14-63	1400	51
									23-64	1100	46	15-62	1100	46	21-63	1250	58
									6-65	1000	34	28-62	0900	52	5-64	1100	64
												3-63	1530	39	11-64	1100	50
												15-63	0845	48	30-64	1500	58
												23-63	1030	46			
												29-63	1530	61			
												1-64	1130	48			
												8-64	1230	50			
												15-64	1130	56			
												22-64	1300	58			
												28-64	0930	52			
												20-65	1040	49			
												28-65	1430	46			

122. Missouri River below Fort Peck Dam, Mont. (6-1320)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
6-50	1300	67	15-49	0900	72	27-50	1700	53	27-49	1000	49	28-51	1100	39	9-57	1215	38
9-50	1730	72	22-49	0800	69	24-52	1100	57	24-50	1100	51	12-52	1200	47	17-57	1130	32
14-50	1100	69	29-50	1000	57	2-60	0830	64	1-51	1200	56	17-52	1645	43	8-60	1120	32
19-50	1100	68	3-60	1615	70	9-60	0800	54	8-51	1900	54	17-60	0925	41	14-60	1040	35
24-50	1130	66	14-60	1430	70	16-60	1500	64	19-51	1800	41	23-60	1055	37	22-60	1230	32
29-50	1000	61	19-60	1140	72	30-60	1210	58	23-51	1200	50	30-60	1315	32	29-60	1140	33
3-51	1100	59	4-61	1135	68	1-61	1235	69	14-52	1130	53	3-61	1145	34	1-61	1130	38
10-51	1330	59	11-61	1105	61	8-61	1530	70	20-52	1210	53	9-61	1115	42	7-61	1115	32
23-51	1230	64	24-61	1655	68	15-61	0830	51	27-52	1545	52	17-61	1215	35	14-61	1200	32
3-52	0930	66	7-62	0930	70	21-61	1520	55	29-56	1015	44	22-61	1100	34	22-61	1000	32
7-52	1245	72	13-62	1535	68	29-61	1230	48	7-57	1050	48	1-62	1445	39	30-61	1130	32
14-52	0930	59	23-62	1015	69	5-62	1300	62	16-57	1015	53	8-62	1245	48	5-62	1205	34
8-60	1155	68	28-62	1115	68	13-62	1530	58	28-57	1030	44	16-62	0825	43	12-62	0840	32
29-60	1250	64	1-63	1500	67	19-62	0900	54	7-60	1220	62	21-62	1000	43	28-62	1000	32
7-61	1245	66	8-63	1030	67	27-62	1045	56	21-60	1220	48	28-62	1130	35	5-63	0950	34
13-61	0835	58	16-63	1255	64	6-63	1515	68	6-61	1155	49	1-63	1430	50	18-63	1330	33
21-61	1030	60	23-63	1600	71	13-63	0820	54	13-61	1050	55	22-63	1500	32	17-64	1530	32
27-61	1240	70	30-63	1300	64	19-63	1515	50	26-61	1620	48	27-63	0850	44	28-64	1330	32
28-61	1430	74	7-64	0820	56	26-63	1100	49	4-62	1100	57	16-64	1015	36	2-65	1440	42
2-62	1220	61	14-64	0930	57	3-65	1130	53	11-62	1305	55	5-65	1515	49	9-65	1300	37
9-62	1620	68	9-65	1630	66	10-65	1530	54	17-62	0830	50	12-65	1515	39	17-65	0945	35
19-62	1000	71	13-65	1430	64	17-65	1530	52	25-62	1005	49	19-65	1330	42	23-65	1020	34
3-63	0845	70	20-65	1100	59	24-65	1210	58	3-63	1320	59	24-65	1515	36	30-65	0900	33
12-63	1030	59	28-65	1215	62				10-63	1540	50						
19-63	1400	70							17-63	1320	58						
26-63	1505	68							2-64	1130	50						
6-64	1330	67							30-64	1130	46						
10-64	1530	62							1-65	0840	52						
17-64	1500	70							8-65	1040	52						
24-64	1300	62							15-65	1500	50						
2-65	1000	54							22-65	1155	52						
9-65	1500	62							28-65	1525	53						

123. South Fork Milk River near Babb, Mont. (6-1322)

Location.--At gaging station, lat 48°45'20", long 113°10'00", in NW¼ sec.34, T.35 N., R.12 W., on right bank 300 ft upstream from bridge on FAS 464 ("Duck Lake Road"), 14½ miles southeast of Babb, and 15½ miles northwest of Browning. Datum of gage is 4,731.6 ft above mean sea level, datum of 1929.

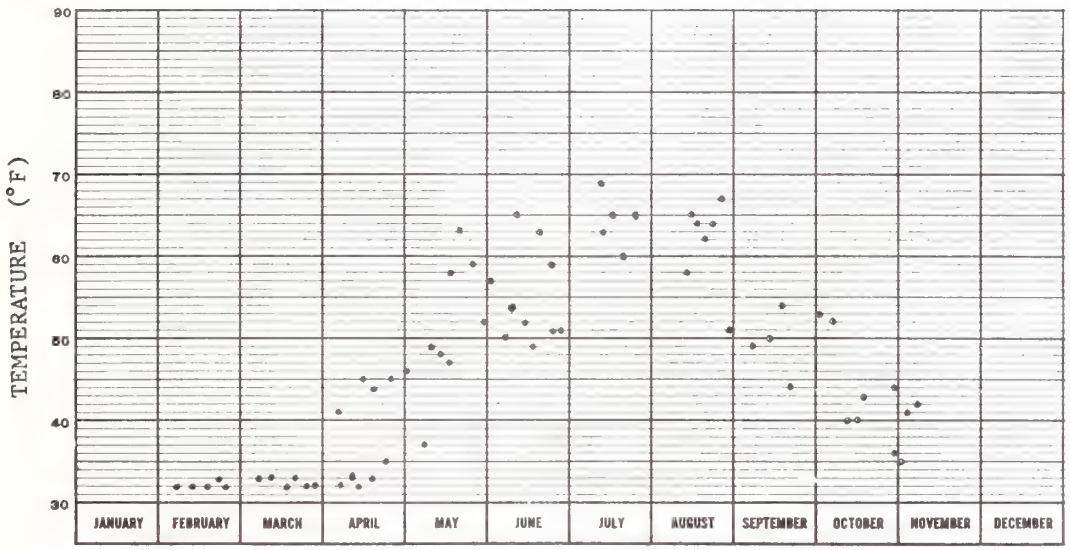
Drainage area.--68.6 sq mi.

Water temperature records available.--65 spot observations made at time of discharge measurements during period May 1961 to November 1965 (seasonal records only).

Extremes.--Discharge 1961-65: Maximum, 12,000 cfs June 8, 1964; minimum, 1.3 cfs Aug. 22, 1961.

Water temperatures 1961-65: Maximum observed, 69°F July 11, 1962; minimum, freezing point on many days during winter months.

Cooperation:--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1961-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			5-63	1740	32	20-62	1805	32	17-62	1430	44	24-61	1330	63	13-61	1715	65
			11-63	1240	32	11-64	1100	33	4-63	1300	41	1-62	1230	46	26-61	1830	59
			26-63	1530	32	30-64	1620	32	15-63	1235	45	15-62	1410	47	11-63	0900	50
			15-64	1900	32	9-65	1100	33	4-64	1140	32	29-62	1500	59	29-63	1545	51
			25-65	1400	33	24-65	1345	33	9-64	1530	33	17-63	1400	58	12-64	1835	54
						29-65	1655	32	21-64	1055	35	6-64	0835	37	24-64	1445	63
									10-65	1325	32	13-64	1140	49	1-65	1715	57
									16-65	1435	33	31-64	1715	52	15-65	1920	52
									27-65	1510	45	14-65	1025	48	17-65	0925	49
															28-65	1645	51
July			August			September			October			November			December		
11-61	1650	63	14-61	1610	65	20-61	1405	44	17-61	1010	40	1-63	1200	35			
11-62	1610	69	29-61	1000	67	10-62	1655	49	31-61	1625	36	4-64	--	42			
17-63	1200	60	15-62	1730	64	19-63	1400	54	1-62	1355	53	2-65	1650	41			
14-64	1430	65	18-63	1815	64	14-64	1725	50	31-62	1420	44						
27-64	1610	65	13-64	1130	58				19-63	1040	43						
			16-65	1830	62				6-64	0940	52						
			31-65	1030	51				18-65	1710	40						

124. Milk River at western crossing of international boundary (6-1330)

Location.--At gaging station, lat 49°00'30", long 112°32'40", in NE¼ sec.1, T.1, R.20 W., fourth meridian, on left bank half a mile north of international boundary, 22 miles upstream from North Milk River, 23 miles southwest of Milk River, Alberta, and at mile 680.4. Altitude of gage is 3,820 ft (from topographic map).

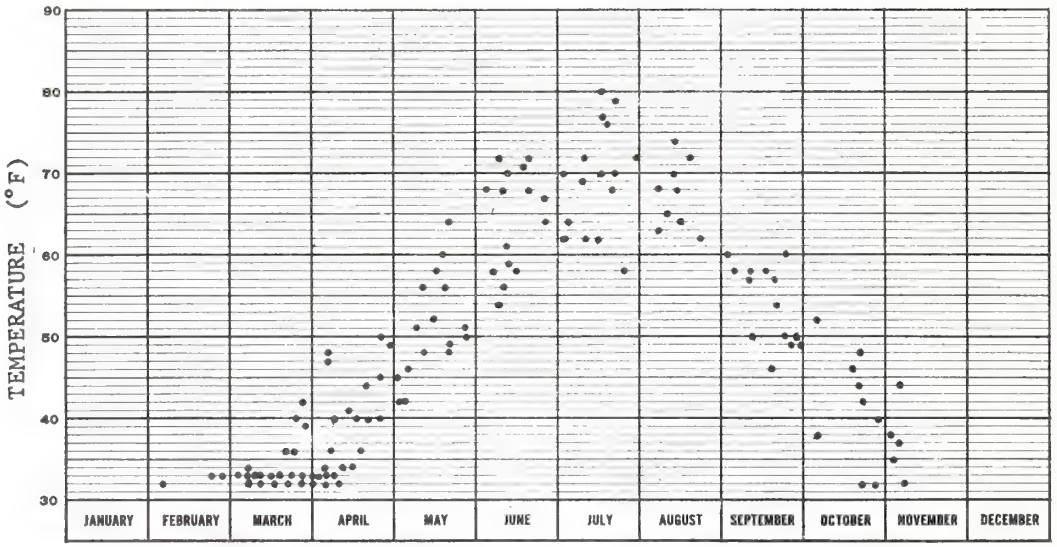
Drainage area.--397 sq mi.

Water temperature records available.--157 spot observations made at time of discharge measurements during period April 1949 to October 1965 (seasonal records only).

Extremes.--Discharge 1931-65: Maximum, 7,930 cfs June 9, 1964; no flow at times.

Water temperatures 1949-65: Maximum observed, 80°F July 15, 1960; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.



Spot observations of water temperatures, 1949-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			7-63	1650	32	31-50	1530	32	4-49	1330	32	18-50	1930	48	10-49	1430	72
			26-64	1300	33	14-51	1645	32	9-53	1430	32	8-52	1130	51	5-52	1845	68
			23-65	1300	33	6-52	1530	32	1-55	1545	33	1-53	1340	42	6-52	1225	68
						20-56	1230	32	26-57	1930	45	5-53	1110	46	15-54	1025	58
						10-59	1430	32	8-59	1300	36	27-54	1730	51	25-57	1930	64
						18-59	1200	33	16-59	1200	40	27-55	1515	50	18-59	1935	68
						25-59	1100	32	6-60	1100	48	17-56	1245	60	13-60	1750	70
						9-60	1310	33	5-61	1230	38	14-58	1100	52	18-61	1900	72
						23-60	1400	36	20-61	1440	40	26-59	1800	51	11-62	1730	68
						7-61	1100	33	2-62	0730	33	19-60	1445	49	16-63	1500	71

124. Milk River at western crossing of international boundary (6-1330)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						15-61	1500	33	5-62	0930	34	1-61	1200	45	7-64	2010	58
						17-61	1300	33	11-62	1100	40	15-61	1600	58	9-64	1830	54
						20-61	1400	36	6-63	1300	47	19-62	1445	64	10-64	1500	56
						22-61	1000	33	19-63	1655	44	18-63	1500	56	11-64	1500	61
						25-61	0900	36	2-64	1500	33	6-64	1200	42	25-64	1400	67
						29-61	1100	39	7-64	1500	33	12-64	1025	48	13-65	1150	59
						1-62	1500	33	10-64	1300	34	10-65	1700	56			
						14-62	1200	33	13-64	1730	41						
						20-62	0930	33	24-64	1745	40						
						22-62	0930	33	28-64	1430	49						
						27-62	1530	33	1-65	1100	33						
						5-63	1500	33	7-65	1045	33						
						7-63	1400	34	12-65	1850	34						
						14-63	1030	33	14-65	1120	34						
						19-63	1000	33	17-65	1000	36						
						21-63	1800	34	26-65	1800	50						
						26-63	1130	40									
						28-63	0930	42									
						3-64	1030	33									
						10-64	1230	33									
						17-64	1100	33									
						19-64	0905	33									
						31-64	1600	33									
						3-65	0900	33									
						8-65	1400	33									
						11-65	1200	33									
						15-65	1400	33									
						23-65	1130	33									
July			August			September			October			November			December		
12-49	1900	72	14-50	1500	68	12-49	1830	50	5-51	1125	52	4-50	1500	44			
2-50	1530	70	8-51	1515	68	24-50	1800	60	21-53	1630	42	7-51	1630	32			
10-52	1300	69	7-52	1330	63	11-51	1350	57	6-54	1130	38	6-62	0900	37			
20-54	1040	68	23-54	1915	62	8-52	1300	58	26-57	1510	32	4-63	1700	35			
10-55	1225	62	14-58	1830	74	24-53	1140	50	30-58	1100	40	3-64	0930	38			
9-56	1900	69	14-59	1655	70	26-55	1735	49	17-59	1800	46						
17-58	1850	76	8-60	1300	68	12-56	1910	58	18-60	1600	44						
2-59	1545	70	14-62	1000	64	19-58	1550	57	20-61	1800	32						
28-59	1530	58	10-64	1410	65	17-59	1400	46	16-62	1445	46						
15-60	1310	80	18-65	1405	72	27-61	1430	50	22-65	1605	48						
20-61	1500	79				15-62	1300	58									
14-62	1230	62				19-64	1500	54									
1-63	1705	62				2-65	1815	60									
15-63	1700	70				30-65	1400	49									
3-64	0900	64															
19-64	1400	70															
30-64	1805	72															
16-65	1655	77															

125. North Fork Milk River above St. Mary Canal, near Browning, Mont. (6-1335)

Location.--At gaging station, lat 48°59', long 113°03', in NE¼ sec.16, T.37 N., R.11 W., on left bank 1¼ miles upstream from outlet of canal, 2 miles south of international boundary, and 29 miles north of Browning. Altitude of gage is 4,220 ft (from topographic map).

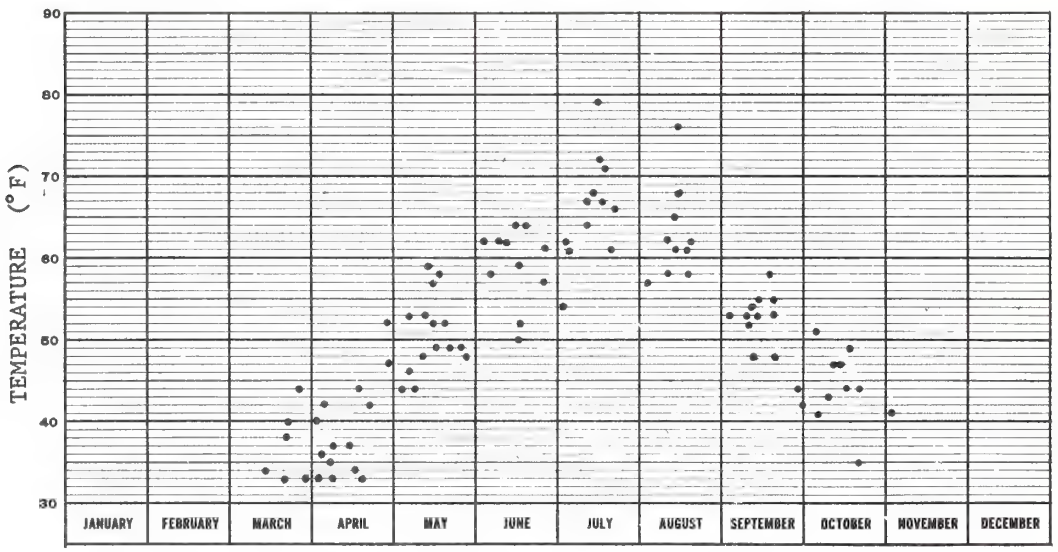
Drainage area.--61.8 sq mi.

Water temperature records available.--95 spot observations made at time of discharge measurements during period May 1949 to November 1965 (seasonal records only).

Extremes.--Discharge 1911-12, 1918-65: Maximum, 2,120 cfs Apr. 22, 1953; no flow Oct. 29, 1942.

Water temperatures 1949-65: Maximum observed, 79°F July 14, 1960; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-65.

125. North Fork Milk River above St. Mary Canal, near Browning, Mont. (6-1335)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						22-61	1540	38	7-59	1030	35	3-49	1300	44	9-49	1930	62
						20-62	1330	33	5-60	1030	42	15-50	1930	49	26-50	1700	61
						13-63	1030	34	8-61	1000	37	6-53	1510	53	5-52	1225	58
						21-63	1500	40	3-62	0930	36	27-54	1320	48	15-54	1425	52
						27-63	1200	44	1-63	1645	40	26-55	1800	49	2-59	1430	62
						29-65	1630	33	18-63	1235	44	16-56	1800	58	18-59	1500	64
									1-64	1050	33	14-58	1635	57	16-60	1730	64
									8-64	1005	33	21-60	1645	49	18-61	1025	64
									15-64	0945	34	19-61	1030	52	12-62	1140	62
									17-64	1100	33	13-62	1315	59	14-63	0930	59
									22-64	1550	42	13-63	1200	52	3-64	1210	62
									29-64	1235	47	7-64	1510	44	26-64	0845	57
									8-65	0850	33	12-64	1625	53	14-65	0920	50
									13-65	1045	37	5-65	1750	46			
									28-65	1930	52	11-65	1005	48			
July			August			September			October			November			December		
6-51	1740	61	13-50	1700	65	12-49	1600	48	11-49	1500	43	2-65	1205	41			
13-55	1830	68	2-51	1100	57	18-50	1700	55	19-53	1735	44						
10-56	1400	67	19-55	1220	58	10-51	1415	53	6-54	1505	41						
17-58	1430	71	14-59	1230	61	4-52	1125	53	16-59	1840	44						
16-59	1830	72	9-60	1000	58	22-53	0945	48	20-61	1550	35						
14-60	1645	79	19-61	1010	62	29-55	1830	44	4-62	1850	51						
20-61	1005	66	14-62	1750	68	13-56	1905	55	17-63	1910	49						
12-62	1750	64	13-63	1745	76	18-58	1500	55	10-64	1830	47						
1-63	1115	54	11-64	1330	62	17-60	1555	58	12-64	0745	47						
18-63	0915	61	17-65	1205	61	12-61	1620	54									
2-65	1310	62				10-62	1400	52									
14-65	1805	67				18-63	1230	53									
						17-64	1805	53									
						30-65	1015	42									

126. North Milk River near international boundary (6-1340)

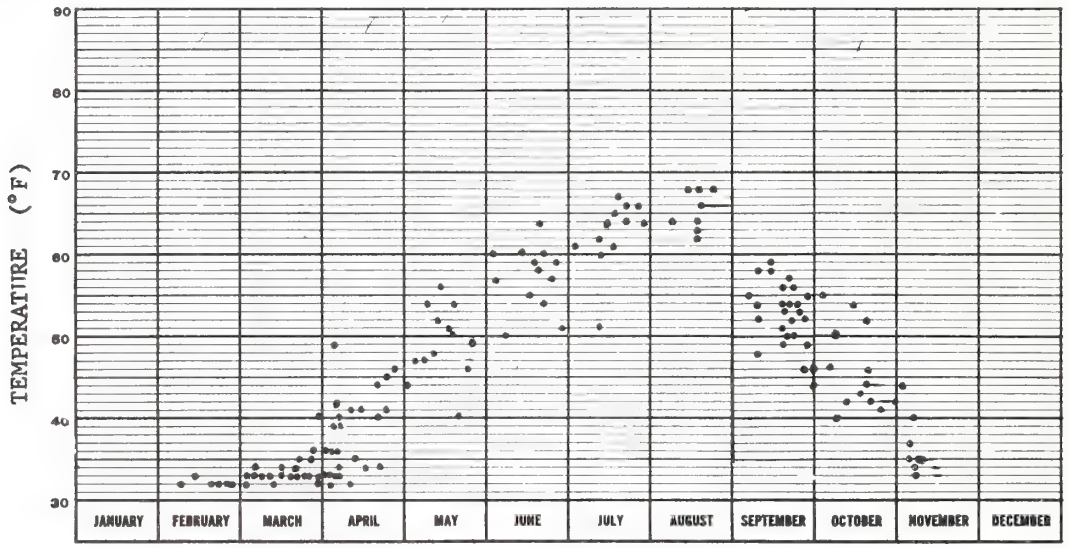
Location.--At gaging station, lat 49°01'20", long 112°58'20", in SW¼NE¼ sec.11, T.1, R.23 W., fourth meridian, on left bank 1,500 ft upstream from highway bridge, 1½ miles north of international boundary, 3 miles east of Whiskey Gap, Alberta, and 11 miles southeast of Kimball, Alberta. Datum of gage is 4,112.16 ft above mean sea level (Geodetic Surveys of Canada datum).

Drainage area.--91.8 sq mi.

Water temperature records available.--164 spot observations made at time of discharge measurements during period April 1949 to October 1965 (seasons records only).

Extremes.--Discharge, 1909-65: Maximum, 2,950 cfs June 17, 1948; no flow Mar. 1, 2, 1940.
Water temperatures 1949-65: Maximum observed, 68°F Aug. 14, 1958, Aug. 17, 1961, Aug. 13, 1963; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.



Spot observations of water temperatures, 1949-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			27-58	1245	32	31-50	1900	32	4-49	1030	32	8-52	0915	47	10-49	1130	60
			28-61	1430	32	13-51	1530	32	9-53	1715	32	27-54	1515	49	2-55	1625	60
			8-63	1130	32	3-59	1415	32	26-57	1150	41	27-55	1215	46	26-56	1625	59
			12-63	1430	33	9-59	1630	33	7-59	1500	39	17-56	1115	51	18-59	1900	60
			25-64	1600	32	18-59	1440	33	15-59	1200	41	14-58	1440	52	17-60	1200	54
			24-65	1230	32	24-59	1500	33	5-60	1530	49	19-60	1205	40	18-61	1510	64
						9-60	2000	33	5-61	1430	39	1-61	1500	44	5-62	1130	50
						23-60	1900	33	19-61	1630	40	15-61	1800	56	16-63	1030	58
						7-61	1500	33	24-61	1630	44	3-62	1400	47	30-63	1845	51
						15-61	1200	34	3-62	1400	36	19-62	1145	54	3-64	1800	57
						17-61	1030	33	11-62	1500	41	18-63	0900	50	16-64	1300	59
						20-61	1200	34	1-63	1300	36	12-64	1500	48	25-64	1030	57
						22-61	1200	35	5-63	1000	36	11-65	1200	54	13-65	1505	55
						25-61	1100	34	6-63	1600	42						
						29-61	1130	40	7-63	1000	40						

126. North Milk River near international boundary (6-1340)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						14-62	1630	33	2-64	1605	33						
						19-62	1300	33	7-64	1630	33						
						22-62	1230	33	10-64	0900	34						
						28-62	1000	33	23-64	1350	34						
						5-63	1100	33	28-64	1700	46						
						7-63	1030	34	1-65	1630	33						
						14-63	0900	33	5-65	1600	33						
						19-63	1200	33	7-65	1625	34						
						21-63	1630	34	10-65	1015	34						
						26-63	1630	35	11-65	1115	32						
						28-63	1200	36	13-65	1405	35						
						3-64	1330	33	16-65	1005	34						
						10-64	0930	32	27-65	1000	45						
						17-64	1330	33									
						19-64	1200	33									
						31-64	1400	33									
						3-65	1325	33									
						8-65	1250	33									
						11-65	1430	33									
						15-65	1250	33									
						23-65	1355	33									
						31-65	1400	33									
July			August			September			October			November			December		
12-49	1630	64	14-50	1230	62	11-49	1730	48	11-49	1630	42	7-51	1330	33			
10-51	1215	51	14-58	1525	68	19-50	1330	57	5-51	0850	46	7-52	1500	34			
10-52	0830	62	14-59	1500	63	11-51	1105	52	7-52	1205	50	2-59	1500	44			
20-54	1425	66	8-60	1500	64	8-52	1640	55	21-53	1515	42	3-60	1100	35			
10-56	0930	60	17-61	1545	68	13-55	1710	58	6-54	1340	40	6-62	1100	40			
17-58	1530	66	14-62	1300	64	16-55	1900	51	3-58	1420	55	5-63	1200	35			
2-59	1340	61	13-63	1400	68	17-55	1435	53	30-58	1500	42	3-64	1110	37			
17-59	1300	64	17-65	1525	66	30-55	1210	44	17-59	1610	46						
15-60	1115	67				13-56	1530	59	20-60	1130	41						
20-61	1230	66				14-58	1825	54	18-61	1350	44						
13-62	2000	61				19-58	1210	54	16-62	1630	43						
30-64	1630	64				22-58	1500	50	17-63	1620	52						
16-65	1230	65				17-59	1130	49	13-64	1625	54						
						17-60	1835	56									
						22-60	1330	52									
						24-60	1600	53									
						28-60	1300	49									
						29-60	1100	55									
						12-61	1200	58									
						11-62	1530	54									
						25-62	0845	52									
						20-63	1100	56									
						21-63	1000	54									
						18-64	1825	50									
						27-64	1300	46									
						30-65	1255	46									

127. Milk River at eastern crossing of international boundary (6-1350)

Location.--At gaging station, lat 48°59'50", long 110°35'30", in NE¼ sec.6, T.37 N., R.9 E., on right bank 500 ft south of international boundary, 500 ft downstream from Canada Coulee, 30 miles north of Rudyard, Mont., 37 miles south of Many Berries, Alberta, and at mile 476.6. Datum of gage is 2,698.4 ft above mean sea level (International Boundary Survey datum).

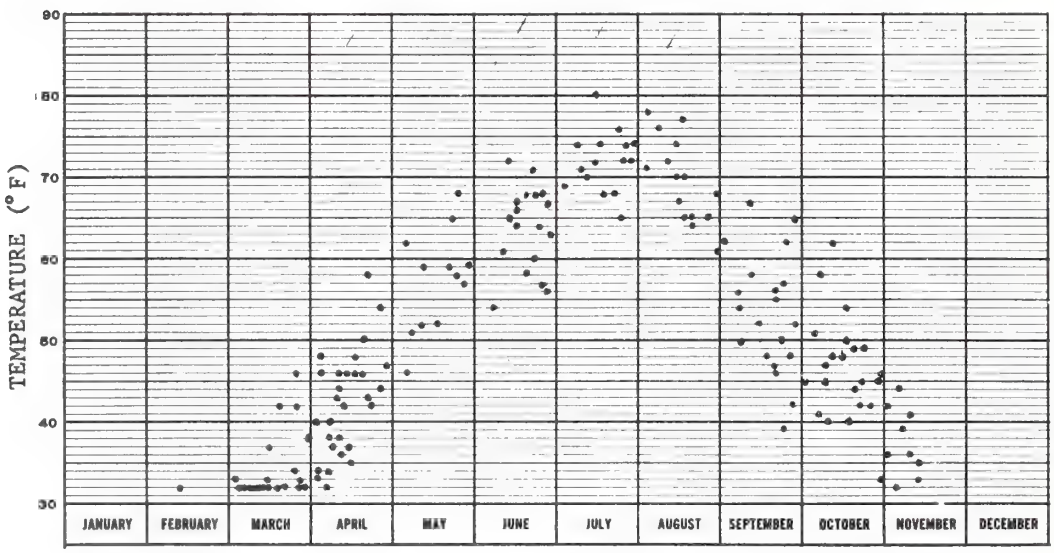
Drainage area.--2,588 sq mi.

Water temperature records available.--192 spot observations made at time of discharge measurements during period March 1949 to October 1965 (few winter records).

Extremes.--Discharge 1909-65: Maximum, 10,700 cfs Apr. 9, 1965; no flow at times.

Water temperatures 1949-65: Maximum observed, 80°F July 14, 1964; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-65.

127. Milk River at eastern crossing of international boundary (6-1350)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			11-63	1230	32	4-49	1800	32	5-49	2000	46	11-51	1145	59	13-50	1230	67
						25-49	1200	32	6-50	1830	38	21-51	2010	59	8-51	1215	54
						12-53	1330	33	5-51	1330	38	15-53	1130	52	20-51	1730	60
						18-53	1200	32	11-51	1500	43	25-55	1430	57	13-52	1530	66
						9-55	1400	32	14-51	1240	37	23-56	1415	68	30-52	1130	63
						24-55	1115	32	24-51	1320	43	6-57	1130	62	25-53	1015	57
						21-56	1330	32	7-52	1630	40	22-58	1230	65	22-54	1230	64
						23-56	1330	42	25-52	1630	58	10-61	1130	52	20-56	1440	68
						29-56	1310	32	1-53	1630	34	22-63	1135	58	11-57	1200	61
						21-57	1400	32	3-53	1330	38	8-64	1535	51	23-59	1430	68
						29-57	1410	33	7-53	1300	38	30-64	1230	59	12-60	1300	65
						3-58	1530	32	10-53	1230	34	6-65	1550	46	12-61	1230	72
						8-58	1500	32	13-55	1530	42				15-62	1620	68
						17-58	1130	32	3-56	1510	33				20-63	1130	71
						30-58	1230	32	6-56	1640	34				13-64	1300	64
						12-59	1200	32	18-56	1330	50				28-64	1130	67
						15-59	1600	32	2-57	1530	40				19-65	1950	58
						18-60	1300	32	13-57	1230	36				29-65	1315	56
						6-61	1430	32	3-58	1230	33						
						13-61	1100	32	8-58	1530	44						
						28-61	1230	42	12-58	1100	46						
						25-62	1230	32	26-58	1230	44						
						27-62	1310	34	16-59	1330	48						
						31-62	1315	38	13-60	1200	46						
						2-63	1320	33	9-61	1200	44						
						5-63	1240	34	11-61	1100	41						
						14-63	1450	37	30-61	1300	47						
						16-63	1350	32	5-62	1640	48						
						28-63	1525	46	13-62	1150	46						
						3-64	1430	32	9-63	1430	46						
						11-64	1230	32	19-63	1200	46						
						21-64	1310	32	2-64	1240	33						
						4-65	1450	32	4-64	1205	38						
						5-65	1500	32	8-64	1135	38						
						9-65	1720	32	18-64	1500	46						
						13-65	1245	32	28-64	1230	54						
						21-65	1315	32	6-65	1330	32						
									12-65	1420	37						
									15-65	1900	35						
									22-65	1240	42						
									28-65	1230	54						

127. Milk River at eastern crossing of international boundary (6-1350)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
19-50	1830	68	17-50	1900	65	20-49	1200	52	15-49	1630	49	3-49	1600	44			
20-53	0920	65	18-54	1300	64	30-49	0930	52	12-51	1400	50	4-52	1000	39			
16-55	1530	68	16-55	1730	70	26-50	0700	57	8-52	1240	47	7-53	1330	35			
10-56	1300	70	29-55	1330	65	13-51	1230	56	14-52	0930	40	5-54	1100	41			
24-57	1500	74	13-56	1300	74	26-51	1215	39	22-52	1245	49	7-55	1400	33			
2-58	1230	69	18-57	1330	65	17-53	1030	58	5-53	1700	41	3-56	1500	32			
23-59	1230	72	2-58	1100	71	23-55	1600	46	22-53	1630	45	5-58	1230	36			
12-60	1130	72	15-58	1600	77	25-55	1450	50	5-54	1600	58	1-59	1100	42			
6-61	1300	74	31-58	1600	68	17-56	1200	67	11-55	1300	48	1-61	1630	36			
9-62	1200	71	31-59	1300	61	23-57	1330	56	15-56	1200	44						
14-63	1330	74	9-60	1600	72	29-59	1630	42	22-56	1735	43						
22-63	1230	76	2-61	1500	78	1-60	1300	62	8-57	1210	40						
14-64	1730	80	13-62	1100	70	13-61	1200	54	8-58	1600	45						
27-64	1300	72	6-63	1630	76	22-61	1620	48	27-59	1600	42						
28-65	1100	74	14-64	1330	67	28-61	1330	44	4-60	1230	51						
						30-62	1430	65	9-60	1330	48						
						22-63	1030	60	9-61	1500	49						
						27-63	1200	62	31-62	1200	46						
						10-64	1230	50	8-63	1130	45						
						23-64	1500	55	31-63	1200	33						
						28-64	1030	48	1-64	1135	45						
						23-65	1525	47	12-64	1700	54						
									30-64	1240	45						

128. Sage Creek at international boundary (6-1360)

Location.--At gaging station, lat 49°00'10", long 110°11'30", in SE¼ sec.3, T.1, R.2 W., fourth meridian, in Alberta, on right bank a quarter of a mile north of international boundary, 1 mile east of Wild Horse Port of Entry, and 5 miles north of Simpson, Mont. Altitude of gage is 2,800 ft (from international boundary map).

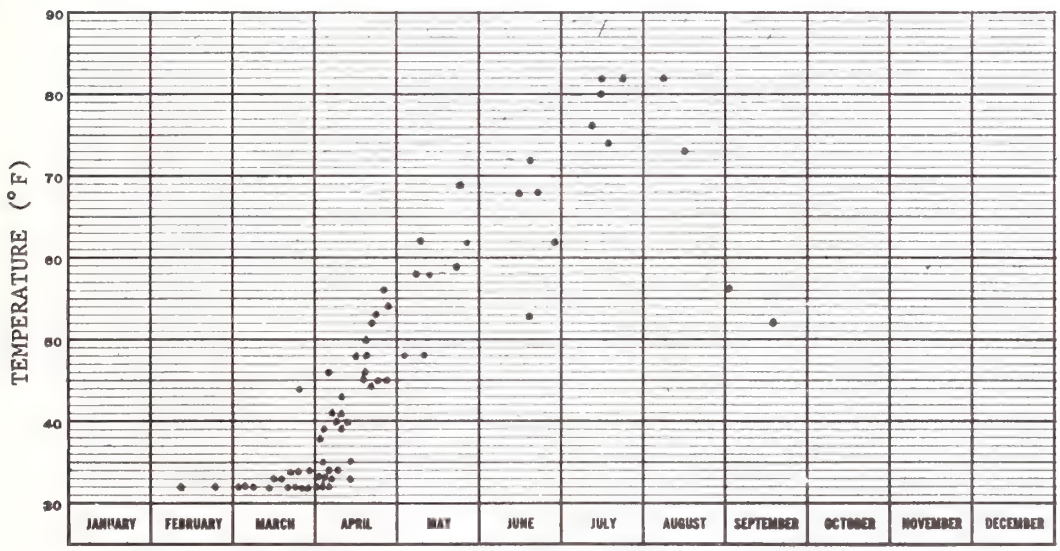
Drainage area.--220 sq mi.

Water temperature records available.--77 spot observations made at time of discharge measurements during period April 1949 to October 1965 (seasonal records only).

Extremes.--Discharge 1946-65: Maximum, 52 cfs Sept. 6, 1951; no flow for most of each year.

Water temperatures 1949-65: Maximum observed, 82°F Aug. 16, 1963, July 14, 26, 1964; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.



Spot observations of water temperatures, 1949-65.

128. Sage Creek at international boundary (6-1360)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			10-63	1300	32	28-57	1330	32	7-49	1230	46	8-51	1330	58	23-53	1420	53
			26-63	1300	32	30-57	1725	34	24-52	1400	56	22-51	1800	69	20-56	1950	68
						4-61	1530	32	12-54	1330	39	12-55	1430	58	16-62	1440	68
						14-61	1135	33	15-54	1600	46	20-55	1130	59	18-62	1720	72
						18-61	1205	34	3-55	1300	32	25-56	1030	62	30-65	1430	62
						3-63	1615	32	7-55	1420	34	7-57	1200	62			
						6-63	1500	32	11-55	1600	35	7-64	1205	48			
						13-63	1410	32	13-55	1430	40	2-65	0930	48			
						15-63	1655	33	17-56	1810	48						
						17-63	1635	34	19-56	1555	52						
						27-63	1410	44	1-57	1615	32						
						20-64	1435	32	3-57	1525	39						
						23-64	1510	32	8-57	1230	40						
						25-64	1510	32	10-57	1330	34						
									12-57	1140	33						
									14-57	1130	37						
									18-57	1230	44						
									22-57	1300	53						
									2-58	1500	32						
									4-58	1200	33						
									9-58	1750	43						
									11-58	1205	43						
									17-58	1030	46						
									25-58	1300	45						
									17-59	1300	45						
									6-62	1100	34						
									7-62	1725	41						
									9-62	1105	41						
									11-62	1140	40						
									17-62	1100	50						
									2-63	1200	38						
									1-64	1340	33						
									3-64	1400	35						
									5-64	1310	36						
									7-64	1400	33						
									9-64	1215	41						
									15-64	1525	48						
									27-65	1705	44						
									29-65	1155	54						
July			August			September			October			November			December		
15-55	1200	74	16-55	1215	73	22-54	1330	52									
11-56	1200	76	6-63	1200	82	1-65	1110	56									
14-63	1730	80															
14-64	1400	82															
26-64	1400	82															

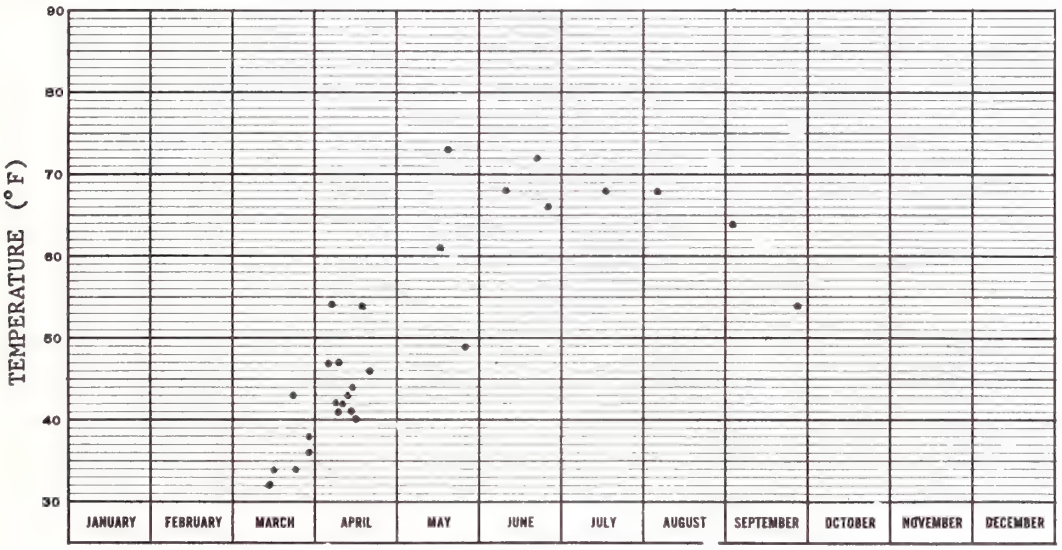
129. Big Sandy Creek near Assinniboine, Mont. (6-1395)

Location.--At gaging station, lat 48°32', long 109°50', in SW¼SW¼ sec.18, T.32 N., R.15 E., on right bank 2 miles northwest of Assinniboine, 6 miles upstream from mouth, and 22 miles downstream from Sage Creek. Altitude of gage is 2,510 ft (by barometer).

Drainage area.--1,805 sq mi.

Water temperature records available.--30 spot observations made at time of discharge measurements during periods March 1949 to November 1953, April 1955 to December 1965.

Extremes.--Discharge 1946-53, 1955-65: Maximum, 5,570 cfs Apr. 3, 1952.
Discharge 1946-53: No flow at time in each year.
Water temperatures 1949-53, 1955-65: Maximum observed, 73°F May 18, 1957; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1955-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						25-49	1600	43	4-51	1720	54	16-52	0930	61	10-53	1700	68
						30-50	1030	38	10-51	1930	43	18-57	1730	73	22-53	2050	72
						19-53	1515	34	14-51	1650	40	27-64	1350	49	26-53	1510	66
						25-53	1430	34	8-52	1730	42						
						29-57	1800	38	9-52	1450	42						
						29-48	1320	36	11-52	1155	44						
						14-59	1145	32	17-52	1005	54						
									3-53	1700	47						
									11-55	1500	41						
									14-55	1620	41						
									9-58	1050	47						
									13-65	1230	40						
									22-65	2000	46						
July			August			September			October			November			December		
17-52	1010	68	4-53	1015	68	2-53	1700	64									
						29-53	1800	54									

130. Milk River at Havre, Mont. (6-1405)

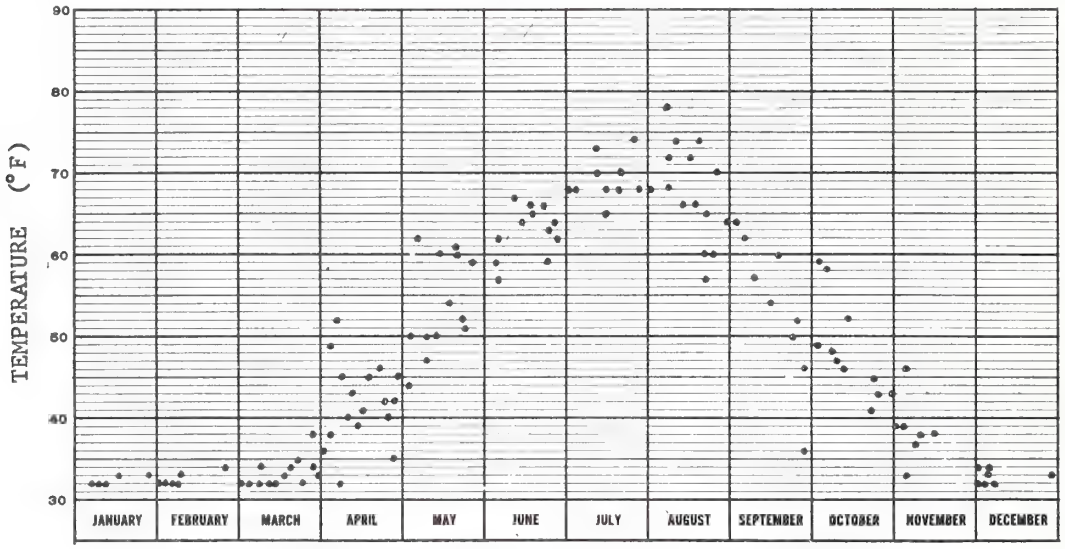
Location.--At gaging station, lat 48°33'30", long 109°40'10", in SE¼SE¼ sec.5, T.32 N., R.16 E., on upstream side of highway bridge on 7th Avenue East in Havre, 30 ft downstream from Bullhook Creek, 9 miles downstream from Big Sandy Creek, and 17 miles downstream from Fresno Dam. Datum of gage is 2,461.11 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--5,844 sq mi, of which 670 sq mi is probably noncontributing.

Water temperature records available.--129 spot observations made at time of discharge measurements during period August 1954 to December 1965. Once-daily observations October 1964 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1899-1923, 1952-65: Maximum, about 20,000 cfs Apr. 12, 1899; no flow at times in several years.

Water temperatures 1954-65: Maximum observed, 78°F Aug. 2, 10, 11, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1954-65

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1964	Max	--	--	--	--	--	--	--	--	--	57	47	35
	Min	--	--	--	--	--	--	--	--	--	45	32	32
1965	Max	35	38	35	52	62	72	76	78	67	56	50	36
	Min	32	32	32	34	44	58	62	58	43	45	32	32

130. Milk River at Havre, Mont., (6-1405)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-55	1700	32	2-55	0830	32	5-55	1630	32	11-55	1830	43	26-55	1730	60	5-56	1500	59
7-60	1030	32	4-60	1100	32	8-55	1600	32	29-55	1900	42	7-57	1600	62	22-56	0900	56
5-61	1330	32	1-61	1730	32	25-55	1330	32	4-56	0950	38	29-58	0800	59	19-57	1030	65
6-63	1030	32	3-62	1030	32	30-57	0915	38	12-57	1500	39	23-59	1230	54	5-59	1100	62
30-64	0800	33	2-63	0900	32	8-60	1630	32	1-58	1700	36	2-60	1900	50	5-60	1000	57
9-65	1645	33	27-64	0900	34	1-61	1630	32	8-58	0945	45	14-60	1100	50	16-60	1130	64
			5-65	0900	33	14-61	1430	34	17-58	1500	45	11-61	1000	47	13-61	1430	67
						7-62	1210	32	20-58	1000	46	11-62	1045	50	19-62	1010	66
						2-63	0815	32	27-61	0830	40	2-63	0955	44	29-63	1730	62
						5-63	1655	34	5-62	1800	52	20-63	1700	60	21-64	1930	66
						18-63	0910	35	3-63	1620	49	24-63	1535	61	25-64	1005	64
						30-64	0815	34	10-64	0930	40	27-64	0945	52	24-65	0945	63
						11-65	1515	33	30-64	1700	45	27-65	0930	51	29-65	1615	62
						31-65	1715	33	8-65	0930	32						
									13-65	1745	41						
									21-65	1800	42						
									29-65	1015	35						
July			August			September			October			November			December		
16-55	1100	68	27-54	1030	60	26-55	1030	50	3-56	1600	58	11-54	1030	38	2-54	1730	32
12-56	1830	73	28-55	1630	60	23-57	1830	60	11-56	1100	52	8-55	1430	38	4-59	1630	32
26-56	1530	74	13-56	1800	74	2-59	1630	64	26-56	1630	41	3-56	1130	33	1-60	1000	32
24-57	1100	68	23-56	1700	74	30-59	1100	36	8-58	0900	47	6-57	1600	37	1-62	1420	34
1-58	1500	68	19-57	1900	66	8-60	1130	57	31-59	1700	43	11-58	1730	38	3-63	1330	34
2-59	0930	68	1-58	0930	68	28-60	0830	52	10-61	1100	46	1-61	1430	39	30-63	1000	33
16-59	0800	65	31-58	1130	64	12-61	1400	54	6-62	0930	48	3-62	1100	46	3-64	1615	33
14-61	1000	70	8-60	1630	72	5-62	1300	62	2-63	1500	59	2-63	0900	39			
30-63	1120	68	18-60	2000	72	30-65	0900	46	1-64	1300	49						
25-64	1210	70	15-61	0630	66				24-64	1315	45						
			8-62	1105	68				27-65	0945	43						
			29-63	1530	70												
			27-64	0845	57												
			27-65	0945	65												

131. Lodge Creek below McRae Creek, at international boundary (6-1455)

Location.--At gaging station, lat 49°00'20", long 109°43'05", in SW¼ sec.5, T.1, R.28 W., third meridian, in Saskatchewan, on right bank a quarter of a mile downstream from McRae Creek, 0.4 mile north of international boundary, three-quarters of a mile northeast of Willow Creek Port of Entry, and 31 miles north of Havre, Mont. Datum of gage is 2,731.0 ft above mean sea level (International Boundary Survey datum).

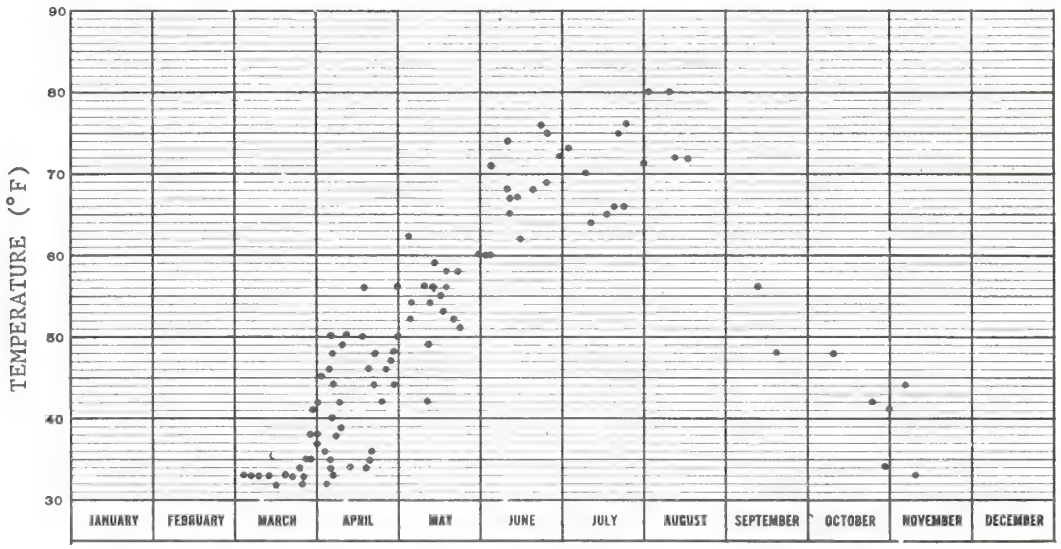
Drainage area.--818 sq mi.

Water temperature records available.--111 spot observations made at time of discharge measurements during period May 1951 to October 1965 (seasonal records only).

Extremes.--Discharge 1951-65: Maximum, 7,760 cfs June 14, 1962; no flow at times in each year.

Water temperatures 1951-65: Maximum observed, 80°F Aug. 2, 10, 1965; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.



Spot observations of water temperatures, 1951-65.

131. Lodge Creek below McRae Creek, at international boundary (6-1455)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						25-56	1330	32	24-53	1530	46	23-51	1505	51	29-52	1515	72
						24-59	1700	34	27-53	1330	47	9-52	1400	56	22-55	1630	76
						25-59	1800	35	7-54	1230	33	4-53	1830	52	4-56	1100	71
						27-59	1730	38	29-55	1300	44	12-53	1200	42	12-57	1600	65
						31-59	1300	37	5-56	1450	32	15-53	1600	53	14-60	1100	67
						21-60	1530	33	4-57	1315	36	21-53	1100	52	5-62	1300	60
						29-60	1500	41	5-58	1305	35	6-54	1230	54	12-62	1600	67
						31-60	1530	42	3-59	1800	45	13-55	1600	54	15-62	1700	62
						15-61	1530	32	8-59	1400	40	11-56	1130	49	18-62	1000	68
						17-61	1620	32	16-59	1730	46	5-57	1400	62	25-62	1200	75
						19-61	1400	33	5-60	1030	46	17-57	1100	58	11-64	1730	68
						27-62	1215	33	7-60	1530	50	13-60	0930	59	2-65	--	60
						31-62	1645	38	12-60	1730	50	16-61	1905	56	10-65	--	74
						4-63	0930	33	16-61	1905	56	15-62	1800	55	24-65	--	69
						6-63	0930	33	5-62	1700	48	31-64	1030	60			
						7-63	1430	33	7-62	1300	44	11-65	--	56			
						9-63	1110	33	9-62	1320	38	20-65	--	58			
						11-63	1200	33	10-62	1540	42						
						13-63	1300	33	12-62	1100	39						
						20-63	1100	33	15-62	1435	50						
						22-63	1400	33	8-63	1640	40						
						24-63	1300	34	21-63	1300	44						
						25-63	1330	34	30-63	1430	50						
						26-63	1200	35	6-64	1530	34						
						28-63	1300	35	10-64	1530	49						
									21-64	1630	48						
									30-64	1600	56						
									13-65	--	34						
									16-65	--	34						
									17-65	--	35						
									18-65	--	36						
									24-65	--	42						
									28-65	--	48						
									30-65	--	50						
July			August			September			October			November			December		
11-56	1630	70	17-55	1215	72	13-65	--	56	31-51	1500	34	6-54	1600	44			
1-59	1330	73	11-56	1600	72	22-65	--	48	26-52	0945	42	8-55	0930	33			
24-62	1300	76	2-65	--	80				8-65	--	48						
12-63	1200	64	10-65	---	80				31-65	--	41						
17-63	1100	66															
21-63	1200	75															
31-63	1500	71															
13-65	--	65															
21-65	--	76															

132. Battle Creek at international boundary (6-1495)

Location.--At gaging station, lat 49°00'10", long 109°25'20", in SW¼ sec.4, T.1, R.26 W., third meridian, on left bank 600 ft north of international boundary in Saskatchewan, 8 miles upstream from Woodpile Coulee, and 30 miles north of Chinook, Mont. Datum of gage is 2,729.8 ft above mean sea level (International Boundary Survey datum, adjustment of 1928).

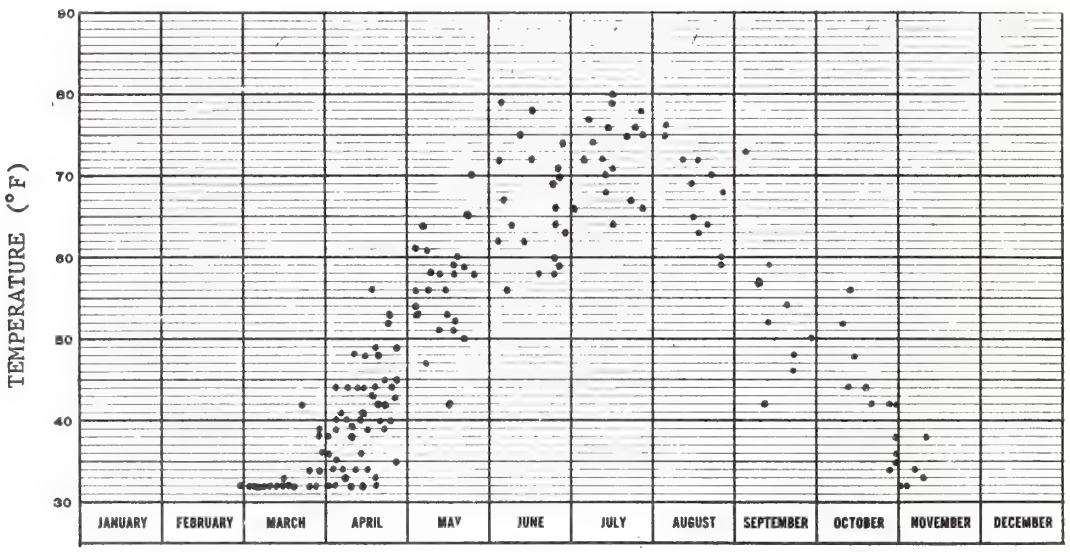
Drainage area.--931 sq mi.

Water temperature records available.--195 spot observations made at time of discharge measurements during period April 1950 to October 1965 (seasonal records only).

Extremes.--Discharge 1917-65: Maximum, 5,820 cfs Apr. 15, 1952; no flow at times in most years.

Water temperatures 1950-65: Maximum observed, 80°F July 15, 1964; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.



Spot observations of water temperatures, 1950-65.

132. Battle Creek at international boundary (6-1495)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			28-58	1500	32	11-53	1530	32	5-50	1000	34	14-50	1045	51	12-51	2000	75
						12-53	1800	33	10-51	1330	34	8-51	1600	58	21-51	1100	60
						23-53	1530	33	9-52	1700	36	8-52	1030	51	28-52	1300	63
						10-54	1100	32	21-52	1700	45	5-53	1500	61	24-54	1430	64
						21-54	1400	32	23-52	1700	52	12-53	1030	42	21-56	1405	58
						8-55	1230	32	4-53	1500	34	21-53	1000	50	24-58	1530	66
						20-55	1400	32	9-53	1730	32	7-54	1630	58	12-59	1130	62
						8-56	1600	32	26-53	1630	48	20-55	1130	59	24-59	1130	69
						15-57	1300	32	8-54	1500	34	9-56	1200	53	7-60	1300	64
						23-57	1120	32	11-54	1800	38	4-57	1230	56	25-60	1130	71
						29-57	1400	32	1-55	1430	32	6-57	1700	64	5-61	1745	79
						4-58	1500	32	20-55	1500	42	14-57	1530	59	15-61	1600	78
						14-58	1630	32	9-56	1630	32	25-58	1400	65	6-62	1100	56
						30-58	1430	38	12-56	1700	32	8-59	1900	61	27-62	1200	74
						23-59	1600	32	17-56	1630	39	14-59	1030	52	5-63	1530	67
						25-59	1630	32	19-56	1500	43	24-59	1000	59	14-63	1000	72
						28-59	1600	34	25-56	1200	40	5-60	1100	47	24-63	1200	59
						19-60	1430	32	27-56	1230	35	13-60	1530	58	4-64	1600	72
						21-60	1300	32	2-57	1600	32	26-60	1230	58	16-64	1000	58
						24-60	1530	32	17-57	1630	42	4-61	1430	53	25-64	1130	70
						29-60	1400	34	21-57	1430	53	17-61	1100	52	4-65	1635	62
						31-60	1730	36	23-57	1100	40	17-62	1330	61			
						5-61	1630	32	2-58	1500	34	3-63	1530	54			
						18-61	1330	32	5-58	1130	40	15-63	1000	60			
						19-61	1500	32	9-58	1230	44	25-63	1335	70			
						23-61	1100	32	18-58	1300	48	9-64	1430	56			
						30-61	1630	39	24-58	1600	45	25-64	1300	58			
						28-62	1530	32	1-59	1530	36	4-65	1645	53			
						1-63	1200	32	3-59	1130	35						
						6-63	1200	32	10-59	1100	39						
						20-63	1230	34	14-59	1500	49						
						26-63	1730	42	27-59	1200	49						
									8-60	1630	48						
									14-60	1130	44						
									27-60	1500	48						
									26-61	1300	42						
									1-62	1630	36						
									3-62	1715	40						
									9-62	1400	40						
									14-62	1545	56						
									4-63	1100	41						
									11-63	1500	48						
									18-63	1330	44						
									24-63	1600	44						
									1-64	1030	38						
									3-64	1600	39						
									5-64	1600	44						
									8-64	1430	44						
									10-64	1200	48						
									14-64	1130	40						

132. Battle Creek at international boundary (6-1495)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
									23-64	1130	46						
									28-64	1600	55						
									12-65	1435	33						
									16-65	1600	32						
									19-65	1805	34						
									23-65	1220	42						
July			August			September			October			November			December		
15-52	1145	64	15-50	1630	72	30-52	1520	50	11-51	1600	52	8-53	1130	33			
13-55	1000	72	19-54	1330	70	17-53	1600	59	30-51	1200	34	9-54	1100	38			
14-56	0930	70	24-55	1030	65	24-55	1600	46	30-52	1630	42	2-55	1200	32			
15-57	1100	71	14-56	1130	69	14-56	1130	57	12-56	1000	44	1-56	1100	32			
26-58	1200	66	14-57	1100	65	17-57	1300	52	31-57	1630	35	6-58	1100	34			
15-59	1530	79	12-58	1200	72	4-60	1200	73	15-58	0930	48						
25-59	1200	76	26-58	1530	68	23-60	1130	54	31-59	1100	36						
5-60	1330	72	15-59	1100	63	16-65	1050	42	13-64	1530	56						
26-60	1700	75	26-59	1500	60	24-65	1145	48	22-64	1130	42						
26-62	1900	78	4-60	1600	75				31-64	1200	42						
6-63	1130	77	26-60	1100	59				19-65	1115	44						
14-63	1530	76	4-61	1200	76				31-65	1100	38						
23-63	1130	75	17-65	0920	64												
7-64	1200	74															
15-64	1500	80															
1-65	1330	66															
14-65	1820	68															
24-65	1040	67															

133. Lyons Creek at international boundary (6-1510)

Location.--At gaging station, lat 49°00'20", long 109°13"50", in NW¼ sec.1, T.1, R.25 W., third meridian, on right bank half a mile north of international boundary, 8 miles south of Arena, Saskatchewan, and 28 miles north of Chinook, Mont. Altitude of gage is 2,800 ft (from international boundary map).

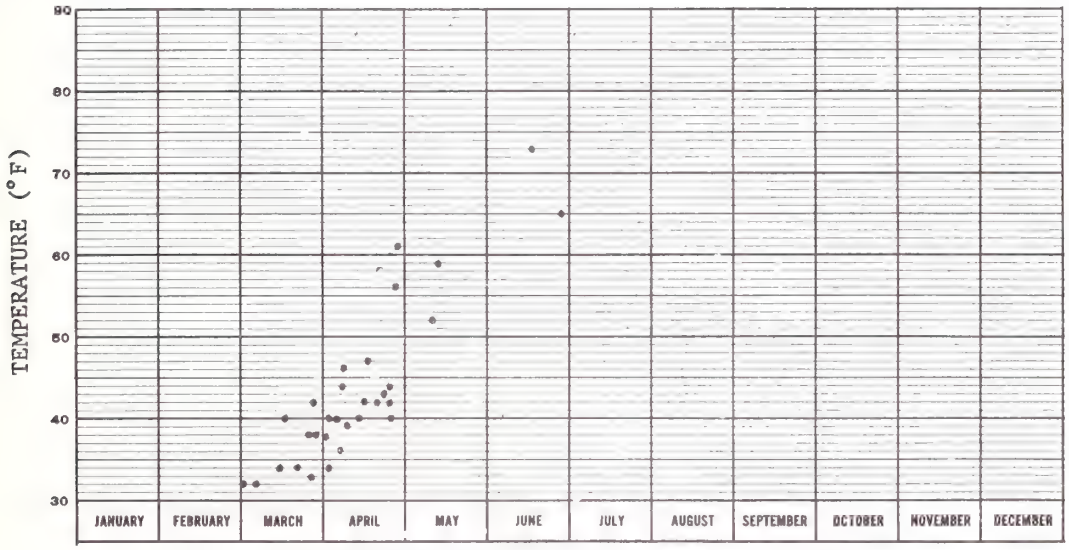
Drainage area.--66.7 sq mi.

Water temperature records available.--33 spot observations made at time of discharge measurements during period April 1950 to October 1965 (seasonal records only).

Extremes.--Discharge 1927-65: Maximum, 1,220 cfs July 6, 1955; no flow for most of each year.

Water temperatures 1950-65: Maximum observed, 73°F June 17, 1962; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.



Spot observations of water temperatures, 1950-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						28-58	1400	33	27-50	1300	42	8-51	1200	59	30-59	1330	65
						30-58	1530	38	16-51	1305	40	7-60	1200	52	17-62	1200	73
						28-59	1700	38	23-52	1500	58						
						24-60	1700	34	27-55	1230	44						
						29-60	1430	42	5-56	1600	36						
						18-61	1215	34	19-56	1330	42						
						19-61	1615	40	25-56	1500	40						
						1-63	1600	32	2-57	1430	34						
						4-63	1200	32	9-57	1500	39						
									19-57	1200	47						
									2-58	1400	40						
									8-58	1700	44						
									23-58	1430	43						
									1-59	1400	38						
									8-60	1200	46						
									1-62	1515	38						
									3-62	1630	40						
									22-65	1345	42						
									29-65	1730	56						
									30-65	1520	61						

134. Milk River near Harlem, Mont. (6-1541)

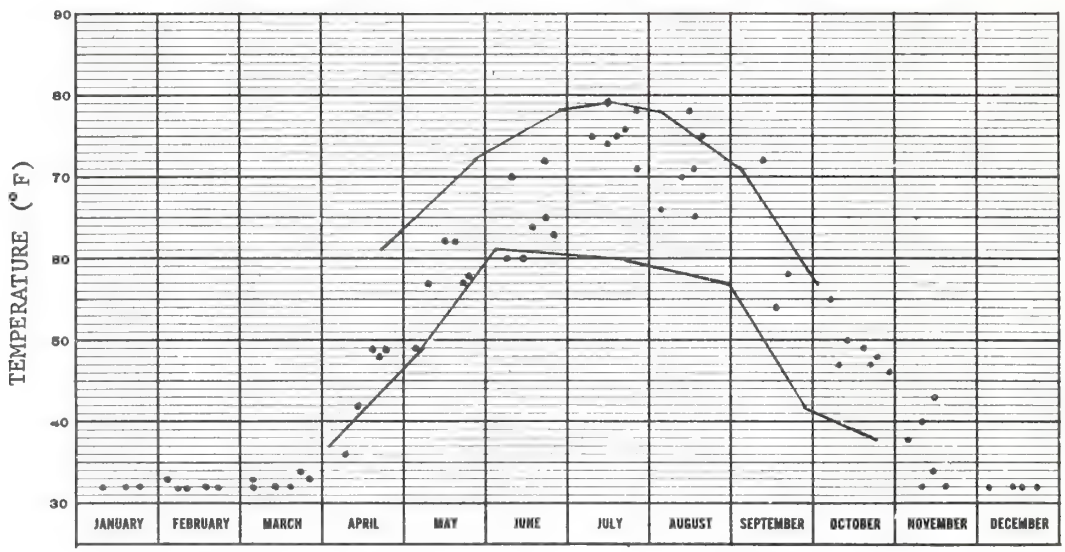
Location.--At gaging station, lat 48°29'30", long 108°45'30", near center of west line of sec.33, T.32 N., R.23 E., on downstream side of bridge on U. S. Highway 2, 3 miles southeast of Harlem, and 6 miles upstream from Thirty Mile Creek. Datum of gage is 2,318.49 ft above mean sea level, datum of 1929.

Drainage area.--9,822 sq mi.

Water temperature records available.--69 spot observations made at time of discharge measurements during period April 1960 to December 1965. Once-daily observations during summer months 1960-65 published in reports of the Geological Survey.

Extremes.--Discharge 1959-65: Maximum, about 6,600 cfs Apr. 19, 1965; minimum daily, 9.4 cfs Apr. 4, 1961.

Water temperatures 1960-65: Maximum observed, 79°F July 13, 14, 1964; minimum, freezing point on many days during winter months.



Spot observations of water temperature, 1960-65.
The lines delineate the range between the highest and lowest temperature from seasonal once-daily observations, 1960-65.

134. Milk River near Harlem, Mont. (6-1541)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
17-62	1430	32	9-61	1350	32	22-61	1520	34	19-60	1640	49	23-60	1705	57	20-60	1650	63
17-63	1000	32	21-62	1635	32	4-62	1800	32	17-61	1650	49	9-61	1020	57	7-61	1600	70
8-64	1440	32	7-63	0915	32	14-62	1710	32	5-62	1200	36	24-62	1930	58	6-62	1130	60
22-65	1520	32	3-64	1430	33	24-62	1510	32	12-62	1235	42	17-63	0850	62	15-62	1130	64
			17-65	1420	32	28-62	1900	33	18-64	1800	48	4-64	1500	49	18-62	1315	65
						29-62	1600	34				19-64	0745	62	18-63	0930	72
						14-63	0840	32							9-64	1230	60
						4-64	1500	33									
						18-65	1320	32									
July			August			September			October			November			December		
19-60	1740	76	16-60	1630	65	19-61	1630	58	12-60	1455	50	9-60	1435	32	15-60	1355	32
10-61	1830	75	14-61	1715	78	11-62	1550	54	19-61	1115	47	15-61	1530	32	13-61	1530	32
25-62	1000	78	16-62	1010	71	9-63	1545	72	10-62	1220	47	9-62	1040	40	3-63	1130	32
18-63	0900	75	12-63	2015	70				18-62	1510	49	5-63	1300	38	21-64	1605	32
15-64	0830	74	4-64	1400	66				30-62	1250	46	12-64	1520	43			
25-64	1830	71	17-65	1300	75				8-63	1550	55	11-65	1500	34			
									22-64	1330	48						
									12-65	1325	50						

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1960	Max	--	--	--	--	--	--	--	74	70	--	--	--
	Min	--	--	--	--	--	--	--	58	56	--	--	--
1961	Max	--	--	--	--	72	78	77	78	71	54	--	--
	Min	--	--	--	--	51	68	69	70	48	38	--	--
1962	Max	--	--	--	61	64	77	76	75	63	57	--	--
	Min	--	--	--	37	52	61	60	62	54	46	--	--
1963	Max	--	--	--	58	68	74	78	77	71	--	--	--
	Min	--	--	--	--	51	63	63	68	58	--	--	--
1964	Max	--	--	--	57	68	76	79	74	64	--	--	--
	Min	--	--	--	--	52	63	71	64	52	--	--	--
1965	Max	--	--	--	--	66	71	76	77	60	--	--	--
	Min	--	--	--	--	49	61	65	57	42	--	--	--

Extremes for years 1960-65

	Max				61	72	78	79	78	71	57		
	Min				37	49	61	60	57	42	38		

135. Peoples Creek near Dodson, Mont. (6-1545)

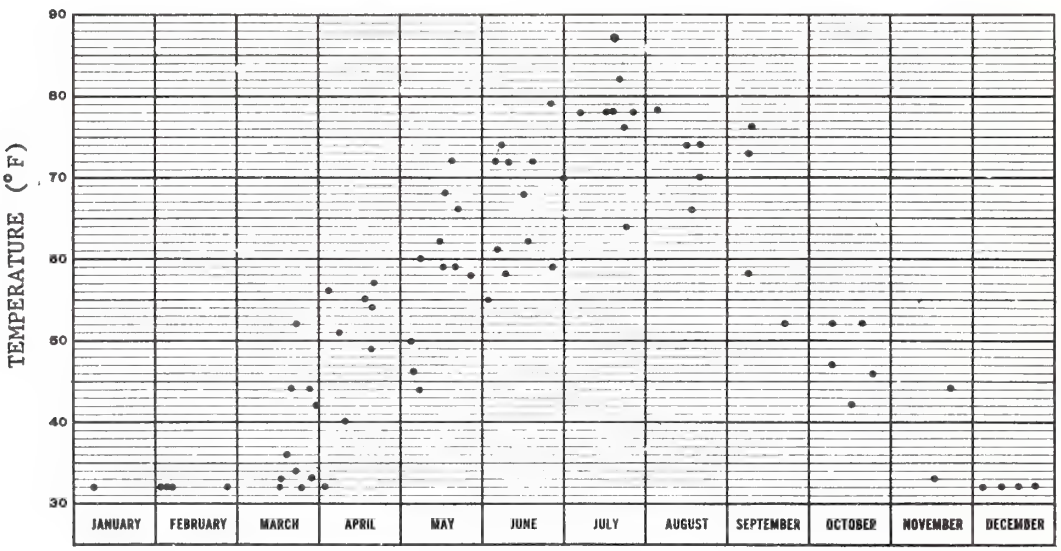
Location.--At gaging station, lat 48°20'34", long 108°21'32", in SE¼NW¼ sec.21, T.30 N., R.26 E., on right bank a quarter of a mile upstream from Indian Service diversion, 6½ miles southwest of Dodson, and 7 miles upstream from mouth. Altitude of gage is 2,310 ft (by barometer).

Drainage area.--670 sq mi.

Water temperature records available.--76 spot observations made at time of discharge measurements during period June 1951 to December 1965.

Extremes.--Discharge 1918-21, 1951-65: Maximum daily, 3,500 cfs Mar. 30, 1952; no flow at times.

Water temperatures 1951-65: Maximum observed, 87°F July 18, 1955; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-65

135. Peoples Creek near Dodson, Mont. (6-1545)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-64	1155	32	4-54	1345	32	18-59	1100	36	21-52	1700	57	15-52	1930	62	27-51	1800	59
			26-54	1505	32	22-60	1130	34	20-53	1910	54	21-53	1430	59	12-52	1420	72
			1-62	1145	32	29-60	1330	44	8-58	1600	51	27-53	1400	58	30-52	1155	70
			6-63	1630	32	22-61	1330	52	19-60	1900	49	17-54	1530	68	1-54	1635	55
						14-62	1430	32	17-61	1415	55	23-60	1310	59	14-60	1320	68
						24-62	1330	32	4-62	1730	56	8-61	1900	60	7-61	1300	74
						29-62	1145	33	12-62	1000	40	23-62	1620	66	6-62	1305	61
						30-62	1700	42	1-64	1200	32	17-63	1030	59	14-62	1245	72
						14-63	1130	33				4-64	1250	46	18-63	1230	72
						20-63	1315	44				5-64	1230	50	9-64	1020	58
												7-64	1400	44	16-64	1400	62
												19-64	1445	72	25-64	1330	79
July			August			September			October			November			December		
24-52	1900	64	22-55	1730	74	12-60	1500	76	16-51	1630	47	22-54	1600	44	4-53	1030	32
26-54	1630	78	16-60	1215	66	9-63	1345	73	19-54	1540	52	16-65	1300	33	12-57	1430	32
18-55	1700	87	16-62	1115	74	11-64	1320	58	12-60	1145	52				21-64	1320	32
19-60	1330	82	4-64	1200	78	20-65	1330	52	22-64	1145	46				16-65	1300	33
25-62	1300	78	19-65	1400	70				12-65	1500	47						
6-63	1245	78															
18-63	1030	78															
15-64	1130	78															
22-65	1700	76															

136. Whitewater Creek near international boundary (6-1560)

Location.--At gaging station, lat 48°57', long 107°52', in NW¼ sec.24, T.37 N., R.29 E., on left bank 500 ft downstream from North Fork, 3½ miles south of international boundary, 11 miles north of Loring, Mont., and 14 miles south of Orkney, Saskatchewan. Altitude of gage is 2,500 ft (from international boundary map).

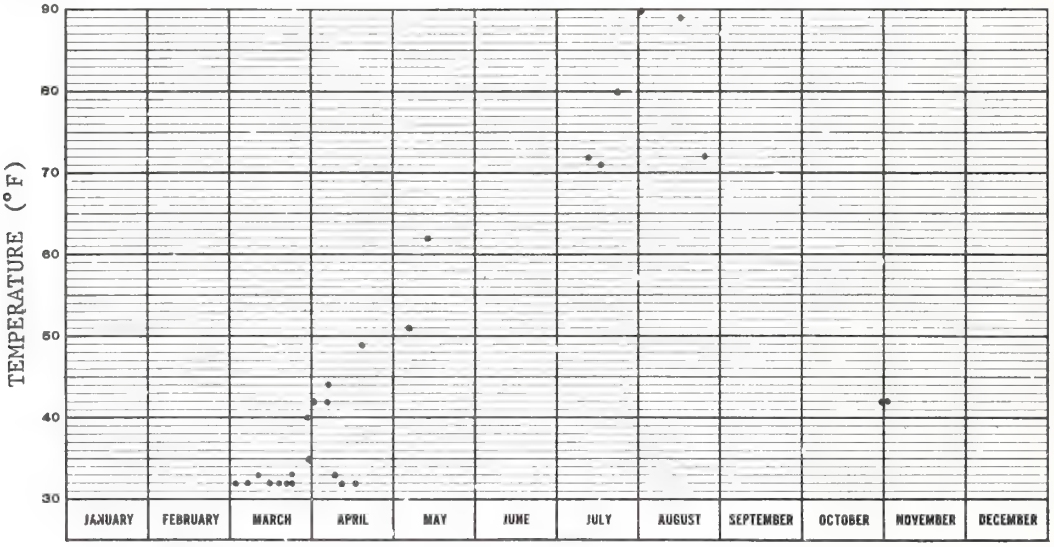
Drainage area.--458 sq mi.

Water temperature records available.--28 spot observations made at time of discharge measurements during period April 1951 to November 1965 (seasonal records only).

Extremes.--Discharge 1927-65: Maximum, 3,500 cfs Apr. 14, 1952; no flow at times in most years.

Water temperatures 1951-65: Maximum observed, 90°F Aug. 1, 1960; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1951-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						23-57	1600	32	21-51	1300	49	10-52	1700	62			
						24-59	1830	32	15-53	1550	32	10-60	1600	62			
						31-59	1600	40	8-55	1730	33	3-65	1100	51			
						9-60	1400	33	10-57	1300	32						
						25-60	1200	33	1-58	1200	42						
						20-61	1200	32	3-58	1130	42						
						25-62	1600	32	3-62	1500	44						
						2-63	1630	32									
						5-63	1500	32									
						31-63	1100	35									
July			August			September			October			November			December		
10-59	1200	71	18-55	1440	89				31-61	1300	42	1-61	1030	42			
8-63	1330	72	1-60	1530	90												
21-65	1010	80	21-61	1000	72												

137. Frenchman River at international boundary (6-1640)

Location.--At gaging station, lat 49°00'00", long 107°18'10", in SE¼ sec.5, T.1, R.10 W., third meridian, on left bank 50 ft north of international boundary and 22 miles northeast of Whitewater, Mont. Altitude of gage is 2,420 ft (from topographic map).

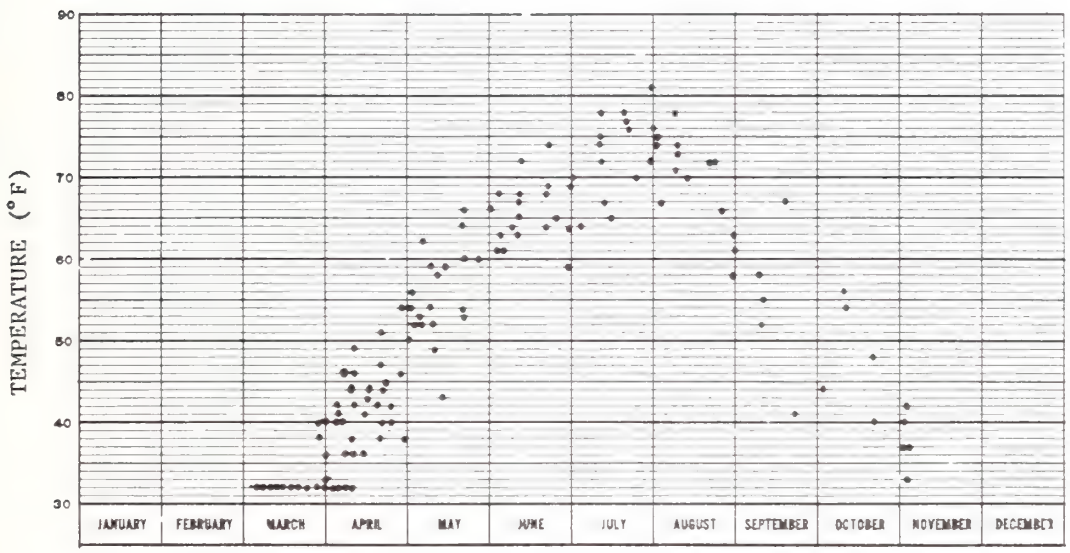
Drainage area.--2,299 sq mi.

Water temperature records available.--193 spot observations made at time of discharge measurements during period March 1949 to November 1965 (seasonal records only).

Extremes.--Discharge 1917-65: Maximum, 22,700 cfs Apr. 15, 1952; no flow at times in most years.

Water temperatures 1949-65: Maximum observed, 81°F July 31, 1964; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.



Spot observations of water temperatures, 1949-65

137. Frenchman River at international boundary (6-1640)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						9-49	1000	32	8-53	1400	32	11-50	1800	49	12-50	1930	65
						8-53	1730	32	15-53	1340	36	7-53	1550	62	23-52	1500	65
						8-54	1500	32	15-54	1200	41	13-53	1000	42	1-59	1230	63
						7-55	1430	32	8-55	1400	40	11-54	1930	52	19-59	1600	74
						7-56	--	32	6-56	1430	32	19-55	1500	54	29-59	1630	59
						14-56	1600	32	10-56	1530	38	2-57	1200	56	11-60	1400	67
						22-56	1500	32	20-56	1230	47	11-59	1200	52	20-60	1430	69
						28-56	1430	32	26-56	1200	40	10-60	1400	59	29-60	1630	69
						30-56	1500	32	30-56	1500	38	20-60	1300	53	1-61	1230	68
						9-57	1500	32	3-57	1500	33	31-60	1200	66	12-61	1200	72
						19-57	1400	32	6-57	1630	32	1-61	1100	52	20-61	1230	74
						30-57	1200	32	11-57	1400	36	11-61	1200	54	1-62	1130	61
						1-58	1400	32	20-57	1500	44	20-61	1400	64	11-62	1100	68
						7-58	--	32	1-58	1500	32	1-62	1130	50	21-62	1100	69
						15-58	1400	32	3-58	1500	40	11-62	1330	52	11-63	1200	63
						29-58	1330	32	8-58	1430	46	23-62	1130	60	19-63	1100	68
						4-59	1330	32	10-58	1130	44	10-63	1030	52	10-64	1400	64
						10-59	1430	32	19-58	1400	47	29-63	1005	60	30-64	1330	70
						16-59	1400	32	22-58	1500	44	11-64	1530	58	3-65	--	61
						20-59	1500	32	13-59	1630	49	19-64	1330	66	19-65	--	64
						24-59	1530	32	21-59	1400	51	3-65	--	52	30-65	--	64
						26-59	1500	32	6-60	1300	42	4-65	--	53			
						31-59	1400	36	11-60	1300	46	13-65	--	59			
						9-60	1200	32	20-60	1400	48						
						28-60	1500	40	29-60	1500	46						
						31-60	1330	40	6-61	1300	41						
						10-61	1305	32	10-61	1330	42						
						17-61	1530	32	21-61	1330	44						
						20-61	1400	32	1-62	1210	32						
						22-61	1330	32	3-62	1230	32						
						29-61	1130	38	10-62	1300	36						
						31-61	1230	40	14-62	1230	44						
						22-62	1150	32	20-63	1100	44						
						25-62	1200	32	30-63	0900	50						
						29-62	1510	32	2-64	1400	32						
						2-63	1130	32	4-64	1530	32						
						5-63	--	32	7-64	1330	32						
						12-63	1025	32	9-64	1300	32						
						16-63	1130	32	14-64	1800	43						
						19-63	1230	32	17-64	1545	42						

137. Frenchman River at international boundary (6-1640)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						21-63	1100	33	21-64	1400	45						
						27-63	1130	32	30-64	1230	54						
						31-63	1355	40	4-65	--	32						
						1-64	1130	32	10-65	--	32						
						5-64	1200	32	19-65	--	38						
						10-64	1230	32	21-65	--	40						
						17-64	1300	32	23-65	--	42						
						21-64	1400	32	28-65	--	54						
						24-64	1230	32									
						31-64	1300	32									
						11-65	--	32									
						20-65	--	32									
July			August			September			October			November			December		
21-58	1630	78	13-50	1555	70	11-62	1030	55	10-51	1500	54	4-51	1200	33			
10-59	1730	74	14-51	1430	67	19-63	1330	67	20-59	1330	40	2-60	1200	37			
20-59	1400	77	11-58	1200	74	10-64	--	58	19-60	1700	40	1-62	1330	42			
31-59	1530	76	31-59	1230	61	10-65	--	52	19-62	1400	48	1-63	1145	40			
11-60	1500	75	1-60	1230	75	23-65	--	41	9-63	--	56	4-65	--	37			
20-60	1000	78	10-60	1700	73				1-65	--	44						
1-61	1130	64	19-60	1400	72												
10-61	1330	72	31-60	1200	63												
3-62	1230	64	1-62	1130	74												
11-62	0930	67	11-62	1100	71												
23-62	1600	70	21-62	1500	72												
10-63	1030	74	31-62	1000	58												
30-63	1130	72	19-63	1400	72												
10-64	1430	78	29-63	1400	66												
23-64	1100	76	2-65	--	74												
31-64	1330	81	11-65	--	78												
13-65	--	65															

138. Rock Creek at international boundary (6-1685)

Location.--At gaging station, lat 48°59'20", long 106°47'30", in SE¼ sec.1, T.37 N., R.37 E., on right bank three-quarters of a mile south of international boundary, 2 miles upstream from Horse Creek, and 9 miles northeast of Thoeny, Mont. Altitude of gage is 2,550 ft (from topographic map).

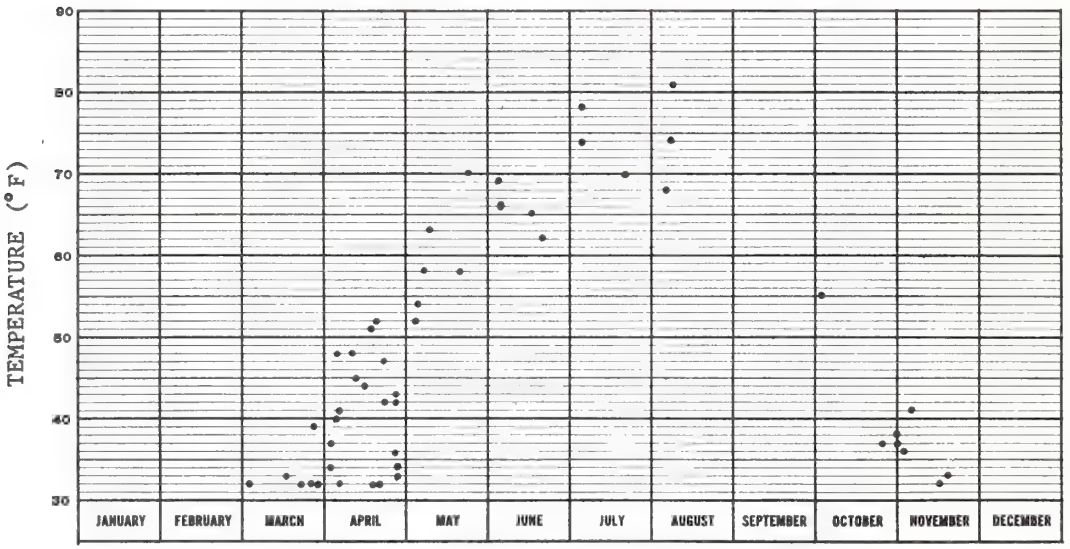
Drainage area.--241 sq mi.

Water temperature records available.--55 spot observations made at time of discharge measurements during period April 1949 to November 1961 (seasonal records only).

Extremes.--Discharge 1914-15, 1927-61: Maximum, 3,310 cfs Apr. 15, 1952; no flow at times.

Water temperatures 1949-61: Maximum observed, 81°F Aug. 8, 1950; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-61

138. Rock Creek at international boundary (6-1685)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						3-54	1345	32	1-49	1900	34	9-52	1725	58	19-49	1600	62
						23-59	1310	32	6-49	1600	41	19-55	1225	58	17-52	1630	65
						25-59	1220	32	10-49	1400	48	5-58	1130	54	6-60	1420	66
						27-59	1720	32	18-49	1430	52	10-60	1840	63	5-61	1515	69
						25-60	1045	32	22-50	1000	42	2-61	1320	52			
						26-60	1710	32	27-50	1400	42	23-61	1510	70			
						28-60	1725	39	18-51	1030	32						
						29-60	1320	39	20-51	1130	32						
						16-61	1310	33	25-51	1930	36						
						27-61	1550	32	26-51	1100	33						
									26-51	1200	34						
									27-51	1600	43						
									17-52	1040	51						
									21-52	1100	47						
									16-53	1600	32						
									6-54	1300	32						
									2-58	1725	37						
									5-58	1630	40						
									14-59	1300	44						
									5-60	1415	48						
									13-61	1200	45						
July			August			September			October			November			December		
6-50	1830	78	8-50	1630	81				1-52	1600	55	6-49	1530	41			
5-51	1630	74	7-52	1600	74				31-56	1420	38	18-54	1155	33			
23-54	1800	70	5-53	1905	68				31-58	1200	37	15-57	1240	32			
									24-61	1200	37	1-61	1215	36			

139. Horse Creek at international boundary (6-1690)

Location.--At gaging station, lat 48°59'20", long 106°50'10", in SE¼ sec.3, T.37 N., R.37 E., on right bank three-quarters of a mile south of international boundary, 1½ miles upstream from mouth, and 8 miles northeast of Thoeny, Mont. Altitude of gage is 2,540 ft (from topographic map).

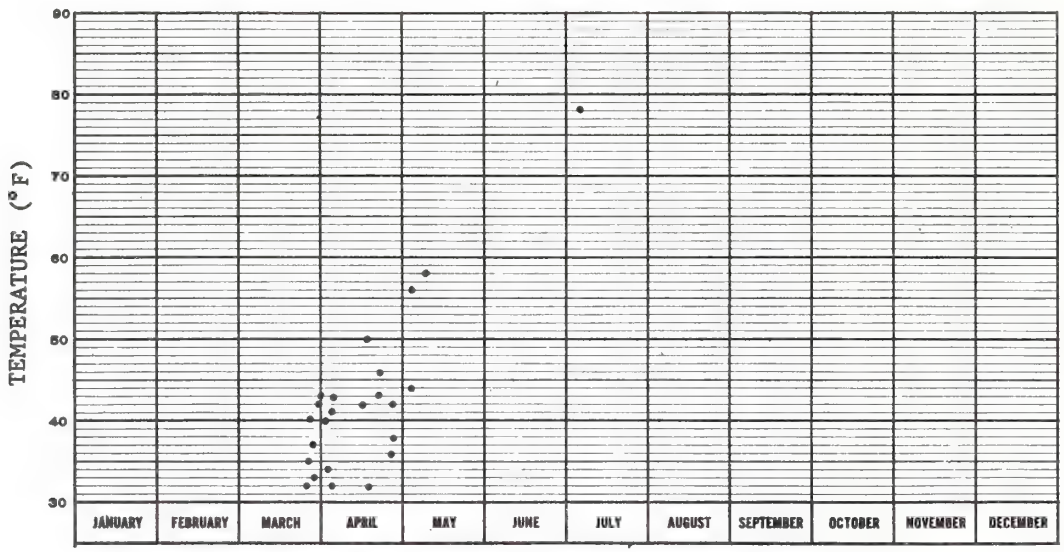
Drainage area.--73.5 sq mi.

Water temperature records available.--30 spot observations made at time of discharge measurements during period April 1949 to November 1961 (seasonal records only).

Extremes.--Discharge 1914-61; Maximum, 1,800 cfs Apr. 15, 1952; no flow for most of each year.

Water temperatures 1949-61: Maximum observed, 78°F July 6, 1950; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-61

139. Horse Creek at international boundary (6-1690)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						25-59	1610	32	2-49	1600	34	4-51	1100	44			
						27-59	1425	33	6-49	1400	43	9-52	1850	58			
						25-60	1600	32	22-50	1300	43	5-58	1300	56			
						26-60	1230	35	26-50	1800	42						
						27-60	1500	40	27-50	1500	42						
						28-60	1300	37	18-51	1230	32						
						30-60	1520	42	19-51	1700	32						
						31-60	1100	43	25-51	1700	36						
						27-61	1220	33	26-51	1600	38						
									27-51	1300	42						
									14-52	1520	42						
									17-52	1410	50						
									21-52	1300	46						
									6-54	1520	32						
									1-58	1730	40						
									5-58	1800	41						
									6-60	1535	48						
July			August			September			October			November			December		
6-50	1730	78															

140. Rock Creek below Horse Creek, near international boundary (6-1695)

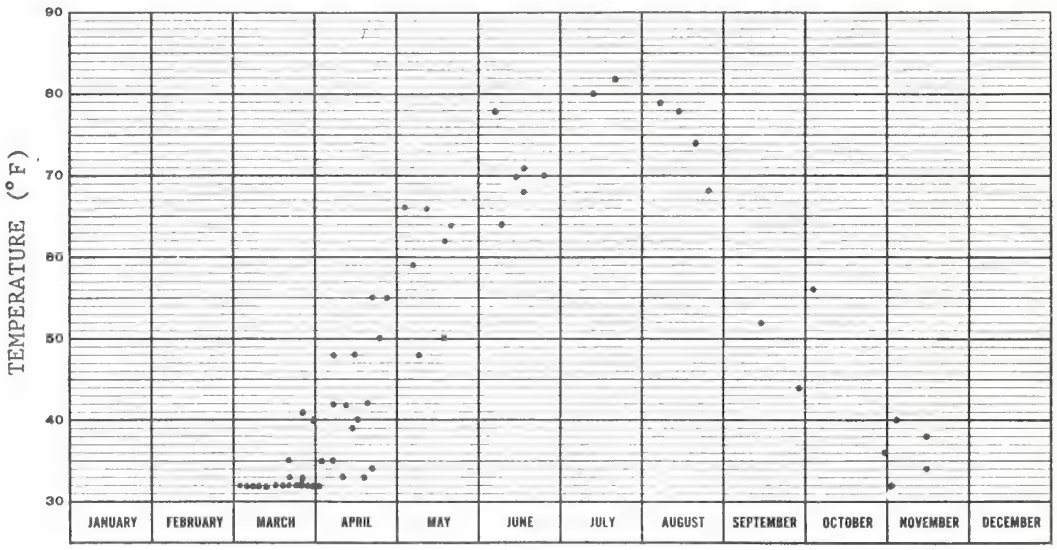
Location.--At gaging station, lat 48°58'10", long 106°49'50", in NE¼ sec.15, T.37 N., R.37 E., on right bank 1 mile downstream from Horse Creek, 2 miles south of international boundary, and 21 miles northwest of Opheim, Mont. Altitude of gage is 2,530 ft (from topographic map).

Drainage area.--328 sq mi.

Water temperature records available.--66 spot observations made at time of discharge measurements during period October 1957 to November 1965 (seasonal records only).

Extremes.--Discharge 1916-26, 1956-65: Maximum observed, 3,610 cfs Mar. 31, 1925; no flow at times in most years. Flood of Apr. 15, 1952, reached a discharge of 5,110 cfs.
Water temperatures 1957-65: Maximum observed, 82°F July 19, 1965; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1957-65

140. Rock Creek below Horse Creek, near international boundary (6-1695)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						5-58	1345	32	1-58	1815	32	5-58	1400	59	6-60	1300	64
						23-59	1100	32	2-58	1915	35	10-60	1600	66	5-61	1400	65
						25-59	1445	32	5-58	1450	42	2-61	1400	54	12-62	1600	71
						27-59	1300	33	14-59	1330	48	22-61	1750	66	12-63	1515	68
						24-60	1305	32	6-60	1430	48	8-62	1535	48	29-64	1100	70
						25-60	1800	32	23-60	1305	42	8-63	1540	48	11-65	1010	70
						26-60	1010	32	13-61	1240	43	21-63	1030	50			
						27-60	0925	32	4-62	1540	35	21-64	0900	62			
						29-60	1020	38	10-62	1415	42						
						30-60	1715	41	25-62	1400	55						
						31-60	0900	40	14-64	1100	40						
						27-61	1340	32	28-64	1430	55						
						25-62	2000	33	10-65	1430	33						
						30-62	1310	32	15-65	1115	33						
						31-62	1310	32	17-65	1245	34						
						4-63	1420	32	27-65	1520	50						
						6-63	1330	32									
						11-63	1350	32									
						19-63	1625	32									
						25-63	1430	35									
						26-64	1145	32									
						31-64	1545	32									
July			August			September			October			November			December		
10-63	1450	80	20-62	1230	74	13-65	1230	52	31-57	1515	36	15-57	1420	34			
19-65	1300	82	6-63	1430	79	30-65	1410	44	2-62	1800	56	1-61	1400	35			
			28-63	1515	68							15-62	1445	38			
			11-65	1230	78							2-65	1220	40			

141. McEachern Creek at international boundary (6-1700)

Location.--At gaging station, lat 48°59'30", long 106°55'40", in SW¼ sec.1, T.37 N., R.36 E., on left bank half a mile downstream from East Fork, half a mile south of international boundary, and 8 miles north of Thoeny, Mont. Altitude of gage is 2,540 ft (from topographic map).

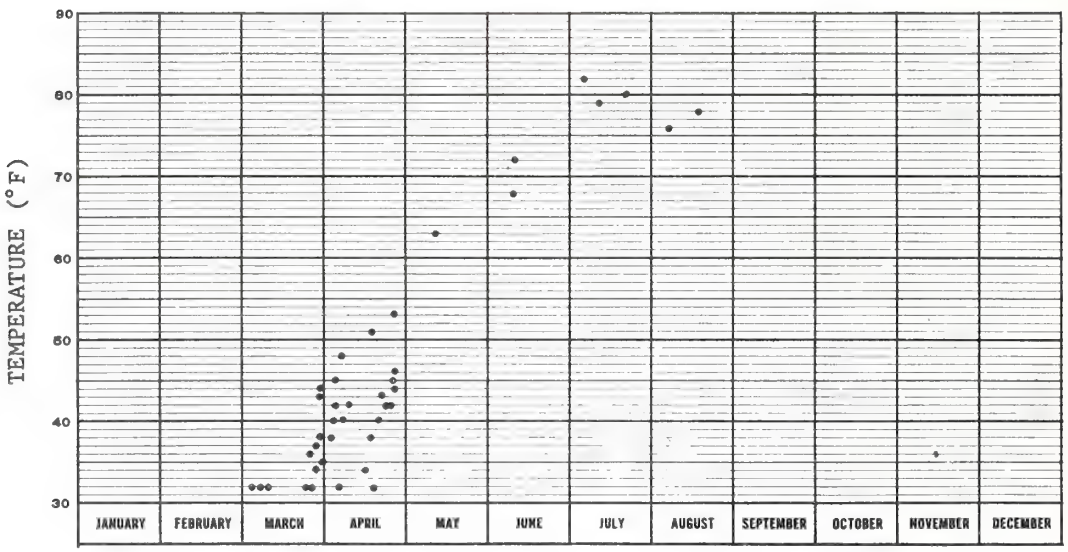
Drainage area.--182 sq mi.

Water temperature records available.--44 spot observations made at time of discharge measurements during period April 1949 to November 1965 (seasonal records only).

Extremes.--Discharge 1924-65: Maximum, 7,080 cfs Apr. 15, 1952; no flow at times in each year.

Water temperatures 1949-65: Maximum observed, 82°F July 6, 1950; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-65

141. McEachern Creek at international boundary (6-1700)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						25-59	1035	32	2-49	1300	38	12-50	1730	63	12-62	1345	72
						27-59	1110	34	6-49	1300	45				12-63	1340	68
						24-60	1700	32	20-50	1900	40						
						27-60	1810	37	21-50	1130	43						
						29-60	1740	43	23-50	0930	42						
						30-60	1230	38	26-50	1500	45						
						27-61	1135	32	27-50	1700	44						
						30-62	1550	35	18-51	1800	32						
						31-62	1000	32	19-51	1400	32						
						4-63	1610	32	26-51	1830	42						
						6-63	1500	32	27-51	1000	46						
						11-63	1145	32	14-52	1420	38						
						25-63	1630	36	17-52	1600	51						
						29-63	1330	44	21-52	1600	50						
									7-54	1350	32						
									2-58	1505	42						
									5-58	1230	40						
									5-60	1245	48						
									4-61	1310	40						
									10-61	1130	42						
									17-65	1420	34						
									27-65	1305	53						
July			August			September			October			November			December		
6-50	1630	82	8-50	1730	76							15-62	1100	36			
10-63	1330	79	20-62	1110	78												
19-65	1145	80															

142. Lime Creek near Tampico, Mont. (6-1722)

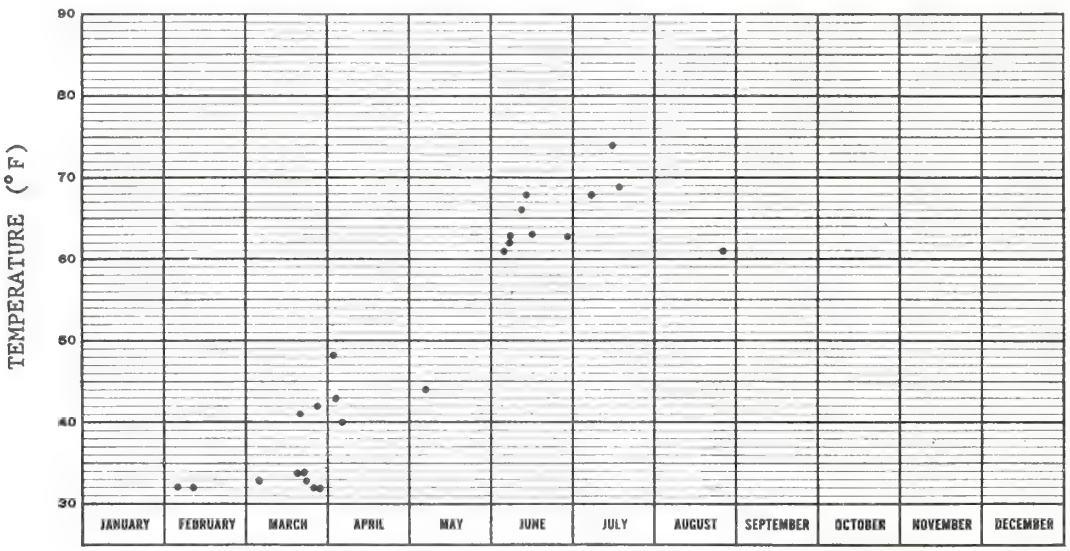
Location.--At gaging station, lat 48°22', long 106°47', in NW¼ sec.15, T.30 N., R.38 E., on left bank 100 ft downstream from bridge on U. S. Highway 2, 4 miles upstream from mouth, and 4 miles northeast of Tampico. Altitude of gage is 2,180 ft (from topographic map).

Drainage area.--105 sq mi.

Water temperature records available.--26 spot observations made at time of discharge measurements during period March 1958 to December 1965.

Extremes.--Discharge 1957-65: Maximum, 2,220 cfs May 6, 1965, but may have been higher June 6 or July 11, 1963; no flow for most of each year.

Water temperatures 1958-65: Maximum observed, 74°F July 14, 1962; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1958-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			6-63	1015	32	28-58	1100	42	2-58	1145	48	7-65	1340	44	14-62	1900	63
			11-63	1310	32	23-59	1700	34	3-62	1635	43				6-63	1230	61
						22-62	1805	34	6-62	1125	40				7-63	1030	62
						23-62	1415	33							8-63	1400	63
						24-62	1000	32							11-63	1200	66
						27-62	1600	32							12-63	0930	68
						5-63	1600	33							29-63	0900	63
						19-63	0905	34									
						20-63	1530	41									
July			August			September			October			November			December		
14-62	1400	74	26-63	1050	61												
16-62	1000	69															
8-65	1000	68															

143. Willow Creek near Glasgow, Mont. (6-1740)

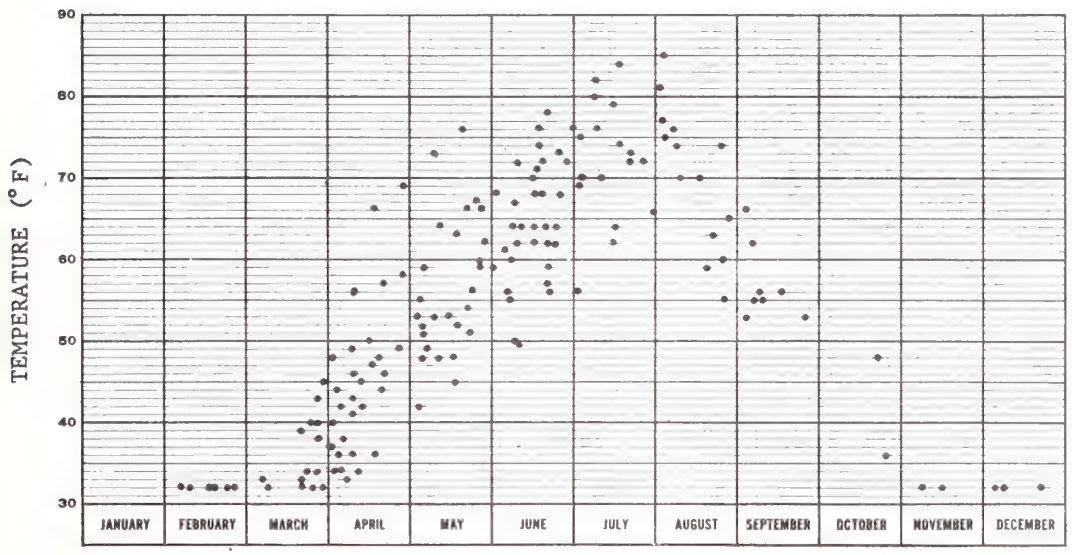
Location.--At gaging station, lat 48°06'52", long 106°40'15", in NW¼NE¼ sec.10, T.27 N., R.39 E., on right bank 6 miles south of Glasgow and 8 miles upstream from mouth. Altitude of gage is 2,110 ft (by barometer).

Drainage area.--538 sq mi.

Water temperature records available.--219 spot observations made at time of discharge measurements during period February 1954 to December 1965, including 76 observations made at time of water quality sampling.

Extremes.--Discharge 1953-65: Maximum, 12,400 cfs July 14, 1962; no flow at times in each year.

Water temperatures 1954-65: Maximum observed, 85°F Aug. 4, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1954-65

143. Willow Creek near Glasgow, Mont. (6-1740)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			10-54	1630	32	29-55	1115	32	7-54	0800	33	12-54	1435	73	1-54	1500	59
			16-54	1100	32	30-55	1110	33	11-54	1545	46	23-54	0830	51	11-54	1845	55
			24-54	0730	32	19-56	1045	32	19-54	1120	46	4-55	1850	48	12-54	0200	50
			24-54	0840	32	20-56	0900	32	1-55	1535	37	5-55	0720	50	12-54	1100	67
			26-58	1645	32	21-56	1155	32	9-55	0710	41	17-55	1215	44	12-54	1845	62
			8-63	1200	33	22-56	1925	32	10-55	1335	49	17-55	1635	46	13-54	1115	62
			11-63	1030	32	24-56	1710	32	11-55	1055	46	18-55	1050	52	14-54	1020	64
			14-63	1630	32	12-57	1730	46	13-55	0925	45	20-55	1905	66	15-54	1615	64
			19-63	1130	32	22-57	1220	34	18-55	1040	44	25-55	1600	60	22-54	1200	78
			26-63	0900	32	24-57	1310	40	28-55	1030	49	11-56	1050	50	21-56	1650	62
						27-57	1520	38	1-57	1145	40	11-56	1420	52	21-56	2400	56
						26-58	1520	34	3-57	1305	44	11-56	1620	58	22-56	0815	56
						9-59	1210	32	11-57	0950	34	12-56	0650	48	22-56	1000	56
						22-60	1220	32	18-57	1540	48	28-57	0930	66	22-56	1315	56
						27-60	1445	43	29-57	1110	69	5-59	1525	59	22-56	1500	56
						29-60	1235	45	1-59	1215	48	1-60	1230	53	22-56	1950	55
						21-62	1445	32	9-59	1120	43	2-60	1500	42	22-56	2150	55
						22-62	1100	34	2-60	1620	48	5-60	1600	52	22-56	2355	55
						25-62	1200	34	11-60	1430	56	16-62	1430	48	23-56	0050	55
						30-62	1100	32	4-62	1145	42	22-62	1340	54	23-56	0835	56
						31-62	1430	37	6-62	0940	38	23-62	1055	56	23-56	1030	56
						7-63	1100	33	13-62	1200	42	23-62	1105	51	23-56	1230	60
						19-63	1000	39	17-62	1500	66	25-62	1600	59	23-56	1435	64
						28-63	1500	40	3-63	0910	36	29-62	1630	62	23-56	1540	64
						20-64	1140	32	8-64	1500	33	14-63	1130	53	24-56	0930	63
						19-65	1130	33	9-64	1130	36	17-63	1530	63	24-56	1500	66
									10-64	1100	46	5-64	1100	48	25-56	1130	64
									16-64	1100	47	5-64	1305	50	27-56	1100	68
									16-64	1100	50	5-64	1430	51	11-57	1130	60
									22-64	1530	57	6-64	1400	49	17-57	1430	71
									2-65	1500	34	11-64	1510	55	1-60	1220	68
									6-65	1530	34	13-64	1500	64	28-60	1025	72
									17-65	1230	36	20-64	1420	76	14-61	1140	64
									29-65	1215	58	28-64	1400	62	15-61	1145	70
															16-61	0940	74
															7-62	1010	56
															12-62	1530	72
															16-62	1300	68
															18-62	1600	76
															21-62	1430	72

143. Willow Creek near Glasgow, Mont. (6-1740)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
															30-62	1350	76
															6-63	1020	62
															6-63	1130	61
															6-63	1245	61
															6-63	1400	61
															6-63	1530	61
															6-63	1715	61
															6-63	1900	60
															6-63	2030	60
															6-63	2350	59
															7-63	0400	59
															7-63	0600	60
															7-63	0800	62
															7-63	0940	63
															7-63	1200	63
															10-63	1530	67
															14-63	1015	68
															20-63	1015	68
															27-63	1140	72
															16-64	1100	62
															20-64	1420	57
															22-64	1200	64
															25-64	1300	73
July			August			September			October			November			December		
1-54	1450	56	7-54	1630	76	16-54	1530	56	26-54	1045	36	9-61	1525	32	5-58	1730	32
3-56	1505	69	10-54	1045	70	7-61	1030	55	19-62	1510	48	15-61	1500	32	6-58	1140	32
2-57	1750	75	16-54	1145	70	7-61	1445	62							8-58	1430	32
15-58	0940	62	17-54	1530	59	11-61	1510	55							9-58	1100	32
11-62	1530	82	18-54	1050	59	25-61	1530	53							6-62	0830	39
15-62	1300	64	19-54	1110	63	3-63	1030	66							20-65	1440	32
19-62	1500	74	20-54	1100	63	5-63	0800	53									
23-62	1500	72	1-61	1500	81	9-65	0915	56									
27-62	1510	72	4-61	1440	85												
30-62	1110	66	2-62	1600	77												
1-63	1715	56	3-62	1530	75												
8-63	1045	76	8-62	1115	74												
12-63	1030	70	26-63	1600	60												
15-63	1100	79	27-63	0545	55												
1-64	1020	70	28-63	1530	65												
9-64	1200	80	25-65	1445	74												
16-64	1400	84															
20-65	1500	73															

144. Milk River at Nashua, Mont. (6-1745)

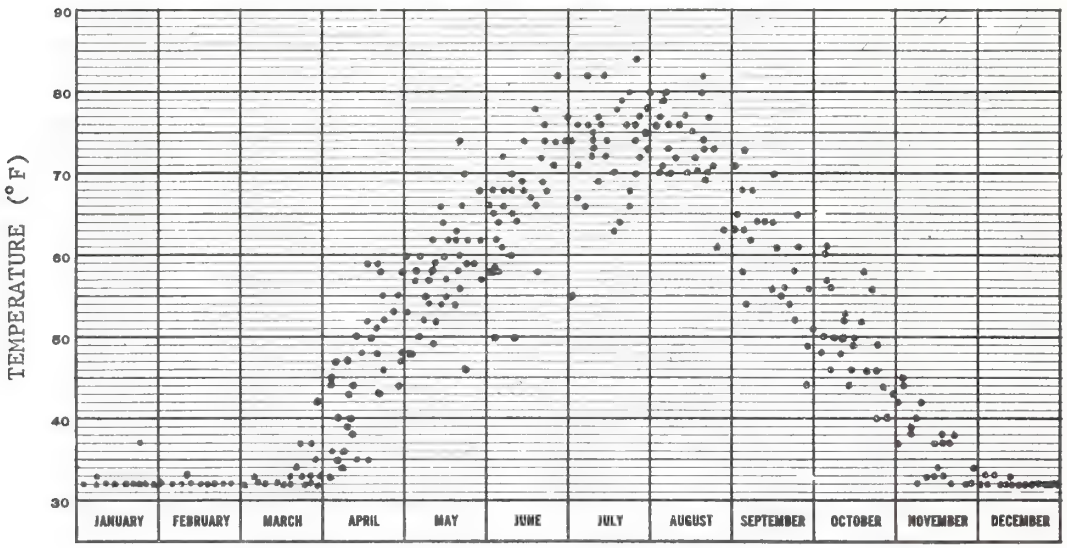
Location.--At gaging station, lat 48°07'50", long 106°21'50", in NE¼NE¼ sec.1, T.27 N., R.41 E., on right bank at downstream side of former highway bridge site, 0.6 mile southwest of Nashua, 5 miles upstream from Porcupine Creek and at mile 24.0. Datum of gage is 2,027.75 ft above mean sea level, datum of 1929, adjustment of 1948.

Drainage area.--22,332 sq mi.

Water temperature records available.--337 spot observations made at time of discharge measurements during period April 1949 to December 1965, including 33 observations made at time of water quality sampling.

Extremes.--Discharge 1939-65: Maximum, 45,300 cfs Apr. 18, 1952; minimum, 0.6 cfs July 15, 1961.

Water temperatures 1949-65: Maximum observed, 84°F July 24, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

144. Milk River at Nashua, Mont. (6-1745)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-57	1245	32	24-58	1100	32	10-54	1040	32	6-49	1215	40	3-49	1200	57	7-49	1330	72
9-61	0900	32	6-61	0900	32	27-58	1510	32	14-49	1330	50	13-49	1100	66	21-49	1500	74
19-61	1015	32	16-61	1440	32	26-59	1240	35	23-49	1230	43	24-49	1230	59	23-50	1500	72
27-61	1140	32	24-61	1445	32	29-60	1045	42	11-52	1100	38	24-50	1400	62	7-51	1700	61
2-62	0920	32	1-62	1120	32	6-61	0930	32	24-52	1300	55	29-50	1830	62	14-51	1600	68
12-62	0815	32	9-62	1440	32	15-61	1100	34	10-53	1615	39	1-51	1330	48	22-51	1700	68
22-62	0930	37	20-62	1000	32	21-61	0925	37	23-53	1425	51	14-51	1930	64	2-52	1520	68
7-63	1210	33	4-63	1445	32	1-62	1450	32	11-58	1500	44	21-51	1900	66	12-52	1700	70
17-63	1340	32	14-63	0930	32	12-62	1055	32	21-58	1300	52	1-52	1650	60	23-52	1520	69
2-64	1000	32	26-63	1430	32	24-62	1840	32	2-60	1205	44	7-52	1830	60	8-54	--	60
10-64	1030	32	7-64	1010	33	26-62	1725	33	11-60	1110	47	9-52	1130	55	1-60	1035	66
30-64	0900	32	15-65	1345	32	4-63	1130	33	12-60	1045	40	12-52	1800	58	2-60	0930	58
7-65	1350	32				12-63	1500	33	15-60	1540	59	19-52	1715	63	9-60	1020	68
						20-63	0900	33	29-60	1100	44	7-53	1615	59	16-60	1615	66
						26-63	1630	37	30-60	1730	48	18-53	1030	54	27-60	1320	74
						9-64	1000	32	4-61	1445	47	26-54	1630	60	9-61	0945	72
						5-65	1330	32	14-61	1455	52	14-56	1500	56	15-61	1445	74
						19-65	1545	33	20-61	1500	58	13-57	1345	62	21-61	1435	76
						31-65	1100	33	24-61	1230	46	28-57	1155	68	28-61	1000	82
									2-62	1500	33	5-60	1245	52	4-62	1430	64
									4-62	1340	36	6-60	1820	54	6-62	1715	58
									5-62	1300	35	13-60	1640	54	14-62	1020	74
									9-62	1620	36	23-60	1240	62	17-62	0900	67
									16-62	1700	48	1-61	1145	58	18-62	1000	58
									23-62	1620	59	12-61	1000	62	26-62	1545	71
									30-62	1400	58	20-61	1100	74	30-62	1520	77
									5-63	1130	45	3-62	0945	58	7-63	1125	66
									11-63	1400	43	8-62	1445	54	7-63	1330	68
									19-63	0930	48	17-62	1615	58	8-63	1600	65
									29-63	1450	47	22-62	1620	59	10-63	1120	64
									16-64	1600	50	23-62	1010	54	20-63	1410	78
									24-64	0900	53	28-62	1430	57	28-63	1100	74
									30-64	0930	55	1-63	1345	53	2-64	0940	65
									8-65	1000	34	9-63	1430	57	2-64	1030	62
									17-65	1600	35	17-63	0900	57	11-64	1330	50
									19-65	1030	35	27-63	1045	62	4-65	1000	50
									21-65	1045	35	5-64	1135	52	14-65	1500	69
												5-64	1830	50			
												7-64	1130	52			
												14-64	1030	60			
												22-64	0930	70			
												5-65	1620	52			
												12-65	1100	49			
												26-65	1030	46			

144. Milk River at Nashua, Mont. (6-1745)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
14-49	1030	74	7-49	1030	76	19-49	1200	54	14-49	--	46	1-49	1530	44	31-53	1000	32
25-49	1330	74	18-49	1400	74	29-49	1530	56	2-50	1900	48	16-49	1430	34	13-57	1445	32
6-50	1700	76	11-50	1330	72	1-50	1430	71	8-51	1700	53	16-50	1630	33	24-57	1035	32
12-50	1430	72	22-50	1700	69	16-50	1430	56	23-51	1530	40	7-51	1430	32	1-58	1530	32
23-50	1900	68	22-51	1730	70	7-51	1100	64	10-52	1300	50	6-52	1645	39	9-60	0900	32
10-51	1630	69	19-52	1030	70	28-51	1500	49	22-52	1345	46	18-52	1530	37	14-60	1605	32
20-51	1030	76	25-52	1530	73	4-52	1445	68	31-52	1545	43	15-54	1630	38	21-60	1525	32
2-52	1400	67	13-54	1430	70	1-60	0900	63	29-56	1445	40	22-54	1040	37	30-60	1010	32
7-52	1645	72	6-59	1140	71	2-60	0940	68	5-60	1325	56	13-58	1500	37	8-61	1100	32
14-52	1500	70	2-60	1420	76	12-60	0940	64	10-60	1025	49	18-60	0925	33	18-61	1420	32
23-52	1030	66	3-60	1205	70	23-60	1000	58	3-61	1155	50	28-60	0940	32	22-61	0900	32
25-52	1630	70	12-60	1710	75	30-60	1005	51	9-61	0930	44	1-61	1545	37	3-62	1440	33
31-52	1045	73	22-60	1200	77	21-61	1630	52	27-61	1130	44	6-61	0920	32	12-62	1440	32
9-54	1230	76	4-61	1010	76	29-61	0930	44	3-62	1335	60	16-61	1050	33	18-62	1340	32
19-54	1550	79	14-61	0845	72	6-62	1450	64	4-62	0930	57	21-61	1330	32	28-62	1445	32
26-54	1035	72	24-61	1430	82	7-62	0855	62	12-62	1410	52	30-61	1000	32	2-63	1030	32
7-55	1530	72	2-62	1440	77	14-62	1500	61	22-62	0900	49	1-62	1505	45	10-64	1435	32
5-56	1130	66	7-62	1435	77	24-62	1445	61	3-63	0940	61	7-62	1030	40	18-64	1000	32
6-60	1410	76	17-62	1035	74	3-63	1415	73	21-63	1330	56	9-62	1445	42	28-64	1030	32
14-60	1430	74	27-62	1135	71	5-63	0915	54	5-64	1135	46	19-62	1410	38	2-65	1100	33
25-60	1615	76	7-63	1330	80	12-63	1430	70	7-64	1150	50	28-62	1130	34	10-65	1410	33
3-61	1300	76	9-63	0900	70	24-63	1650	65	7-65	1100	48	1-63	1430	42	20-65	1310	32
7-61	1010	75	19-63	1430	80	2-64	0840	63	15-65	0945	58	12-63	0905	33			
7-61	1515	82	28-63	1200	61	3-64	0945	58	25-65	1500	46	2-64	1000	44			
13-61	1405	82	5-64	0725	73	1-65	1715	65				12-64	1030	37			
24-61	1600	84	6-64	1030	76	9-65	1345	56				5-65	0945	38			
3-62	0935	71	3-65	1635	79	17-65	1030	50				15-65	1500	33			
13-62	1400	77	9-65	1230	70	28-65	1000	44				24-65	1450	32			
16-62	0800	63	20-65	1430	73												
17-62	1215	64	30-65	1445	63												
31-62	1515	78															
1-63	1415	55															
8-63	1535	77															
15-63	1445	79															
22-63	1530	80															
31-63	1100	80															
1-64	1130	74															
8-64	1430	72															
17-64	1200	78															
27-64	1445	77															
7-65	1120	74															
12-65	1545	73															
30-65	1100	75															

145. Wolf Creek near Wolf Point, Mont. (6-1765)

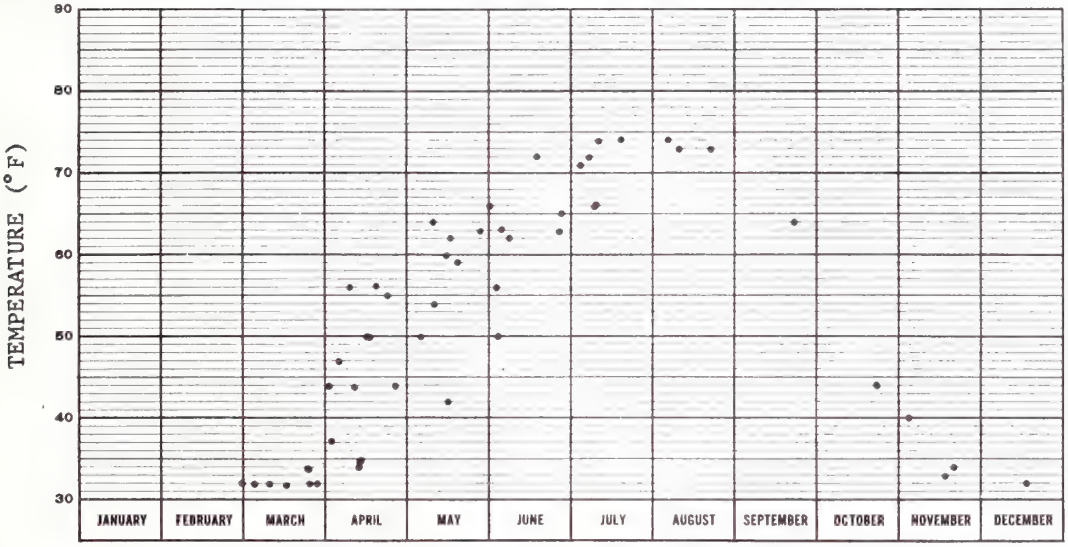
Location.--At gaging station, lat 48°06, long 105°41', near center of N½ sec.17, T.27 N., R.47 E., on right bank 2 miles northwest of Wolf Point and 2½ miles upstream from mouth. Altitude of gage is 2,010 ft (from topographic map).

Drainage area.--251 sq mi.

Water temperature records available.--48 spot observations made at time of discharge measurements during periods June 1950 to September 1953, December 1957 to December 1965.

Extremes.--Discharge 1908-14, 1950-54, 1955-65: Maximum, 9,780 cfs Apr. 4 or 5, 1954; no flow at times in most years.

Water temperatures 1950-53, 1957-65: Maximum observed, 74°F July 18, 1950, July 12, 1962, Aug. 6, 1962; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1950-53, 1957-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			28-61	1210	32	25-58	1230	32	14-53	1015	35	14-51	1230	62	2-50	1130	56
						24-59	1200	34	22-53	1600	55	12-52	1315	60	26-51	1530	65
						15-61	1100	32	2-58	1505	44	26-52	1900	63	25-52	1615	63
						28-62	1315	32	5-60	1620	47	18-53	1300	59	7-62	1325	62
						6-63	1600	32	10-61	1615	56	11-60	1840	64	18-62	1515	72
						11-63	1430	32	12-61	1050	44	31-60	1450	66	4-63	1340	63
									25-61	1455	44	11-61	1035	54	3-65	1515	50
									5-62	1430	37	14-62	1345	42			
									18-62	1150	56	6-63	1615	50			
									16-64	1405	50						
									12-65	1000	34						
July			August			September			October			November			December		
18-50	1600	74	22-50	1500	73	21-50	1600	64	22-52	1120	44	16-50	1400	33	16-57	1510	32
9-51	1700	66	12-52	1500	73							19-63	1400	34			
2-62	1550	71	6-62	1500	74							3-65	1505	40			
12-62	1230	74															
6-65	1240	72															

146. Missouri River near Wolf Point, Mont. (6-1770)

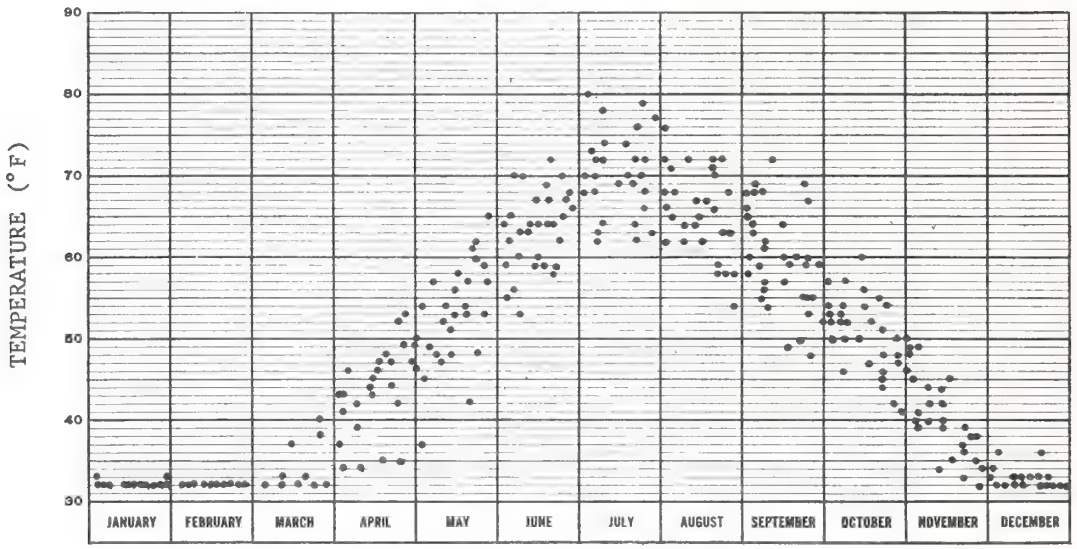
Location.--At gaging station, lat 48°04', long 105°32', in NW¼ sec.28, T.27 N., R.48 E., on right bank 500 ft downstream from bridge on State Highway 13, 6 miles southeast of Wolf Point, 6 miles downstream from Wolf Creek, and at mile 1,701.4. Datum of gage is 1,958.57 ft above mean sea level, datum of 1929.

Drainage area.--82,290 sq mi.

Water temperature records available.--353 spot observations made at time of discharge measurements during period April 1949 to December 1965, including 12 observations made at time of water quality sampling.

Extremes.--Discharge 1928-65: Maximum, 66,800 cfs Mar. 25, 1939; minimum daily, 320 cfs Dec. 10, 1941. Flood of June 14, 1908 reached a stage of about 20 ft, present datum.

Water temperatures 1949-65: Maximum observed, 80°F July 3, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

146. Missouri River near Wolf Point, Mont. (6-1770)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
19-54	1530	32	5-54	1405	32	6-61	1115	32	9-49	1230	42	1-49	1100	46	6-49	1100	65
29-54	1445	32	15-54	1410	32	14-61	1205	37	14-49	1130	43	5-49	1130	45	9-49	1130	70
15-58	1200	32	25-54	1330	32	5-62	1500	32	20-49	1300	44	10-49	1200	54	15-49	1300	64
3-61	1210	32	6-61	1300	32	6-62	1550	32	1-60	1600	43	15-49	1100	56	22-49	1130	72
9-61	1030	32	13-61	1210	32	12-62	1300	32	7-60	1305	46	20-49	1130	57	26-49	1130	62
23-61	1205	32	20-61	1100	32	27-62	1330	38	18-60	1220	46	27-49	1030	59	9-50	1600	53
30-61	1200	32	27-61	1355	32	6-63	--	32	25-60	1300	35	4-50	1430	37	14-50	1230	67
2-62	1035	32	5-62	1145	32	11-63	--	33	3-61	1425	43	10-50	1530	52	29-50	1300	66
3-62	1640	33	12-62	1315	32	18-63	1130	34	10-61	1210	42	14-50	1230	53	11-51	1800	60
8-62	1200	32	19-62	1535	32	26-63	1045	40	17-61	1235	46	19-50	1730	53	18-51	1730	64
15-62	1100	32	26-62	1400	32	17-65	0945	32	24-61	1300	42	21-51	1600	61	22-51	1230	59
22-62	1200	32	4-63	1235	32	23-65	1300	32	2-62	1645	37	7-52	1500	57	9-52	1615	63
29-62	1210	32	13-63	1130	32	29-65	1100	32	4-62	1500	41	13-52	1100	60	16-52	0900	59
31-62	1050	33	18-63	1230	32				9-62	1230	39	27-52	1700	53	23-52	1145	65
7-63	1215	32	25-63	1300	32				16-62	1340	45	2-60	1310	46	6-60	1335	62
14-63	1130	32	3-64	0900	32				18-62	1445	48	9-60	1415	54	13-60	1530	64
28-63	1230	32	10-64	1200	33				23-62	1410	52	16-60	1520	56	20-60	1225	64
6-64	1025	32	17-64	1145	32				27-62	1240	53	23-60	1430	62	27-60	1240	68
13-64	1045	32	3-65	1515	32				30-62	1045	49	1-61	0930	50	12-61	1030	70
20-64	1200	32	10-65	1330	32				15-63	1535	47	8-61	1210	48	19-61	1210	64
27-64	1130	32	19-65	1230	32				29-63	1115	47	15-61	1305	58	26-61	1150	67
6-65	1340	32	25-65	1430	32				13-64	1045	44	22-61	1755	60	4-62	1240	55
20-65	1230	32							20-64	1115	47	29-61	1240	65	6-62	1600	56
									27-64	1100	49	3-62	1120	54	11-62	1100	60
									5-65	1110	34	7-62	1145	48	19-62	1525	69
									12-65	1145	34	14-62	1230	48	25-62	1410	68
									19-65	1230	35	29-62	1000	57	4-63	1130	59
												13-63	1300	51	12-63	1300	63
												20-63	1200	42	18-63	1115	67
												28-63	1140	59	26-63	1130	70
												6-64	1540	49	1-64	1430	64
												18-64	1500	64	8-64	1100	60
												25-64	1130	60	15-64	1500	60
												10-65	1200	47	22-64	1200	58
												24-65	1130	48	29-64	1045	66
															14-65	1230	59

146. Missouri River near Wolf Point, Mont. (6-1770)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
8-49	1030	70	2-49	0800	62	12-49	1000	57	13-49	1000	50	2-49	0930	48	16-53	1200	33
12-49	0830	72	7-49	0800	65	2-50	1630	66	22-49	1030	48	16-49	1100	45	10-57	1250	33
17-49	1530	70	12-49	0915	64	12-50	1200	56	28-49	1030	50	13-50	1425	39	16-57	1345	32
22-49	0830	64	16-49	0800	62	16-50	1800	57	2-50	1600	52	28-51	1600	38	5-60	1320	32
26-49	0930	66	23-49	0800	59	27-50	1330	55	23-50	1330	51	5-52	1530	41	8-60	1555	32
9-50	1235	72	30-49	0830	58	4-51	1400	60	31-50	1530	50	10-52	1650	42	12-60	1000	32
14-50	1800	69	3-50	0800	76	11-51	1530	61	2-51	1730	57	18-52	1245	35	27-60	1250	32
20-50	1100	69	23-50	1930	59	25-51	1600	53	8-51	1400	53	6-56	1155	39	4-61	1135	32
25-50	1200	68	29-50	1800	63	2-52	1345	65	22-51	1430	46	23-56	1225	37	5-61	1455	36
30-50	1000	63	27-51	1300	58	9-52	1300	68	31-51	1700	46	19-58	1355	35	11-61	1220	32
9-51	1430	62	4-52	1700	66	15-52	1200	60	7-52	1445	52	14-60	1245	40	18-61	1150	32
23-51	1730	70	18-52	1415	67	23-52	1300	59	21-52	1315	51	22-60	1210	36	26-61	0930	32
1-52	1200	68	26-52	0715	72	29-52	1645	59	26-56	1215	42	28-60	1205	32	3-62	1205	34
8-52	1500	70	1-60	1550	68	24-58	1135	55	9-57	0950	46	1-61	1430	46	11-62	0920	32
21-52	0945	62	8-60	1255	62	6-60	1005	63	15-57	1330	56	6-61	1330	40	17-62	1030	32
11-60	1355	74	15-60	1555	65	12-60	1320	62	30-57	1130	47	13-61	1205	34	26-62	1115	32
18-60	1320	70	22-60	1255	70	19-60	1115	60	3-60	1335	57	20-61	1220	33	31-62	1115	32
25-60	1250	79	29-60	1105	58	26-60	1425	60	10-60	1300	57	27-61	1210	35	2-63	1300	33
3-61	1130	80	2-61	1325	72	5-61	1240	64	17-60	1125	54	5-62	1140	49	19-63	1310	33
10-61	1210	63	7-61	1130	68	7-61	1440	59	2-61	1315	53	13-62	1235	44	23-63	1400	33
17-61	1130	69	14-61	1220	67	11-61	1330	54	9-61	1135	50	26-62	1215	38	30-63	1200	32
2-62	1230	70	21-61	1150	66	18-61	1730	49	23-61	1200	45	3-64	1310	45	2-64	1330	32
10-62	1515	64	28-61	1215	68	25-61	1230	53	30-61	1210	41	9-64	1110	40	7-64	1200	32
30-62	1130	77	6-62	1415	65	2-62	1245	68	1-62	1425	54	19-64	1230	33	14-64	1130	32
9-63	1130	78	13-62	1125	64	4-62	1200	69	8-62	1130	54	1-65	1205	49	23-64	1300	32
16-63	1050	74	21-62	1550	72	6-62	1700	63	16-62	1145	47	8-65	1200	44	30-64	1300	32
22-63	1235	72	27-62	1355	63	10-62	1230	55	23-62	1120	44	15-65	1130	42	6-65	1130	40
6-64	1135	73	5-63	1110	71	17-62	1115	64	30-62	1130	48	22-65	1145	39	13-65	1100	33
20-64	1130	76	12-63	1050	72	24-62	1215	67	14-63	1130	60	29-65	1445	34	20-65	1100	36
6-65	1130	68	19-63	1130	71	4-63	1200	68	21-63	1200	55						
26-65	1145	72	27-63	1110	72	10-63	1100	72	28-63	1130	42						
			24-65	1115	58	16-63	1240	59	26-64	1215	50						
			30-65	1200	54	24-63	1405	69	4-65	1515	50						
						30-63	1450	52	11-65	1245	52						
						1-65	1330	58	18-65	1120	50						
						7-65	1145	55	25-65	1200	54						
						13-65	1100	60									
						22-65	1215	50									
						27-65	1215	48									

147. Redwater Creek at Circle, Mont. (6-1775)

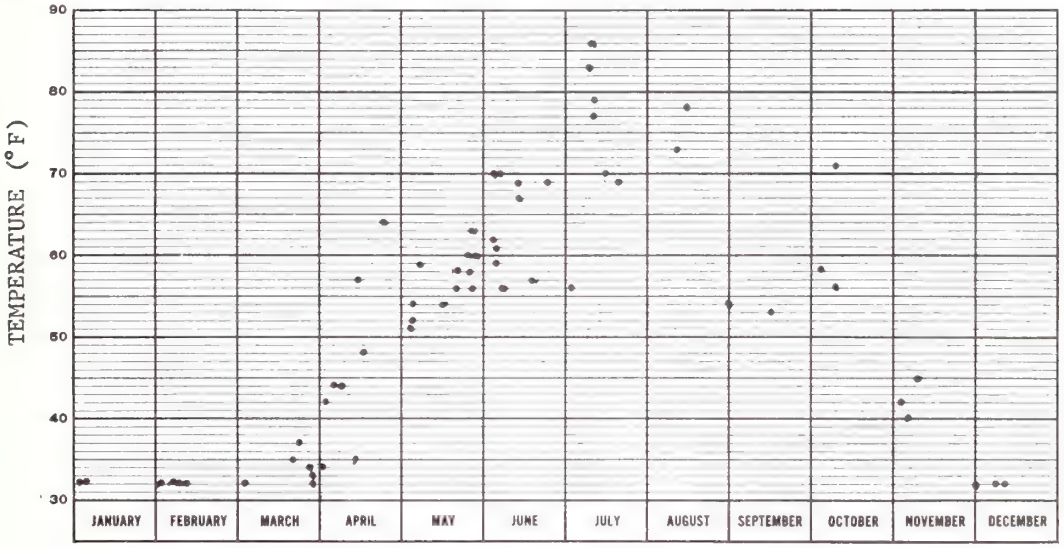
Location.--At gaging station, lat 47°25', long 105°35', in SW¼ sec.11, T.19 N., R.48 E., on left bank at Circle, three-quarters of a mile upstream from Horse Creek, and at mile 79.6. Altitude of gage is 2,380 ft (by barometer).

Drainage area.--547 sq mi.

Water temperature records available.--63 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1929-65: Maximum, 6,730 cfs July 14, 1957; no flow at times in most years.

Water temperatures 1949-65: Maximum observed, 86°F July 12, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-61	1025	32	1-54	0920	32	2-54	1630	32	6-49	0900	44	5-49	0730	51	4-49	0800	59
3-63	1630	32	9-54	1205	32	23-54	1055	37	14-54	1610	57	18-50	1330	58	4-54	1400	62
			5-63	1300	32	21-59	1730	35	3-62	1720	42	29-50	1730	63	13-62	0900	69
			7-63	0950	32	2-61	1150	32	24-62	1700	64	28-52	1030	56	5-63	1830	70
						29-62	1030	34	9-63	1640	44	26-53	1630	60	6-63	0940	61
						30-64	1430	33	15-64	0740	48	26-60	1125	58	7-63	1430	70
						30-65	1500	32	2-65	1430	34	15-62	1710	54	13-63	0820	67
									13-65	1400	35	22-62	1545	56	19-64	1000	57
												29-62	1340	60	24-64	1030	69
												8-63	0830	59	8-65	1300	56
												4-64	1700	52			
												5-65	1300	54			
July			August			September			October			November			December		
13-50	1530	79	12-52	1300	73	14-50	1530	53	11-50	1200	56	4-54	1330	42	7-60	1105	32
2-54	0740	56	14-62	1615	78				4-51	1630	58	6-62	1530	40	10-63	1130	32
12-60	1350	86	31-65	1100	54				8-63	1615	71	11-65	1400	45			
10-62	1730	77										30-65	1400	32			
19-62	--	69															
10-63	1515	83															
15-65	1200	70															

148. Middle Fork Poplar River at international boundary (6-1780)

Location.--At gaging station, lat 48°59'30", long 105°41'40", in SE¼ sec.6, T.37 N., R.46 E., on left bank half a mile south of international boundary, 1½ miles upstream from Coal Creek, and 18 miles northwest of Scobey, Mont. Altitude of gage is 2,460 ft (from topographic map).

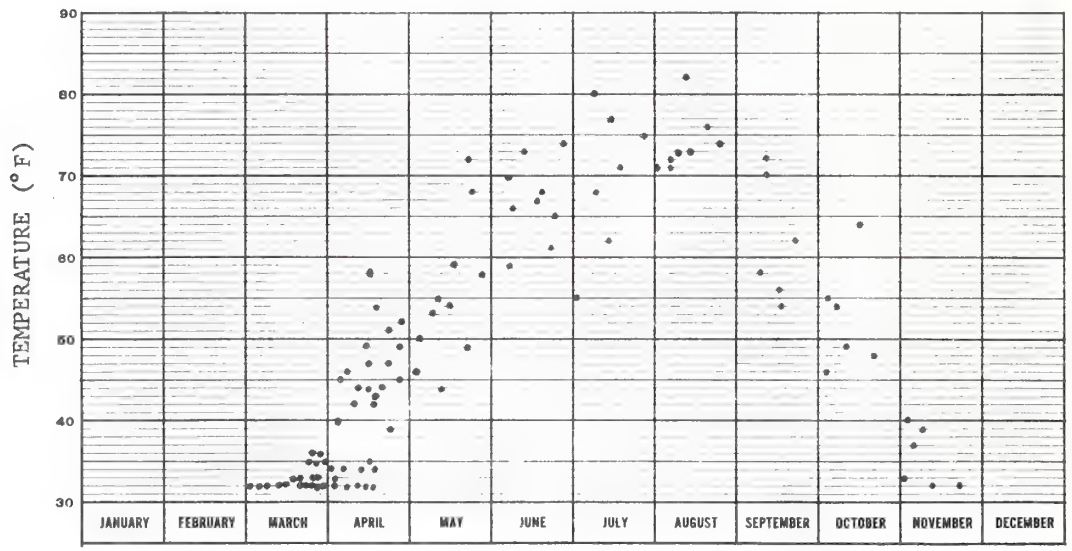
Drainage area.--362 sq mi.

Water temperature records available.--110 spot observations made at time of discharge measurements during period March 1949 to November 1965 (seasonal records only).

Extremes.--Discharge 1931-65: Maximum, 12,700 cfs Apr. 6, 1954; no flow at times.

Water temperatures 1949-65: Maximum observed, 82°F Aug. 12, 1965; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.



Spot observations of water temperatures, 1949-65.

148. Middle Fork Poplar River at international boundary (6-1780)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						30-49	1630	33	1-49	0930	34	3-51	1200	50	23-50	1700	65
						2-54	1335	32	5-49	0900	34	9-52	1030	54	5-51	1630	59
						30-58	1655	33	14-49	1200	47	6-54	1810	53	19-52	1115	61
						31-58	1530	35	15-50	1600	32	11-60	1015	59	6-60	1800	66
						21-59	1500	32	25-50	1630	45	2-61	0945	46	5-61	1830	70
						24-59	1240	32	6-51	1300	32	23-61	1200	68	12-62	1015	67
						14-61	1410	33	10-51	1715	32	8-62	1155	44	13-63	1030	68
						18-61	1445	33	13-51	1200	34	25-62	0950	58	29-64	1500	74
						28-61	1345	35	15-51	1750	32	7-63	1900	55	10-65	1830	73
						6-62	1530	32	16-51	1345	34	20-63	1700	49			
						26-62	1215	35	23-51	1700	39	20-64	1430	72			
						28-62	1215	32	27-51	1600	49						
						5-63	1215	32	6-52	1500	32						
						12-63	1110	32	9-52	1215	32						
						20-63	1240	32	15-52	1500	52						
						22-63	1215	32	18-52	1350	58						
						23-63	1700	33	23-52	1100	51						
						24-63	1350	36	22-53	1155	47						
						26-63	1030	36	15-54	1355	44						
						11-64	1700	32	18-55	1005	44						
						31-64	1045	32	3-58	1035	40						
									14-59	1630	49						
									6-60	1310	46						
									13-61	0850	44						
									2-62	1130	32						
									6-62	1625	45						
									10-62	1800	42						
									25-62	1005	54						
									1-64	1650	33						
									2-64	1430	33						
									3-64	1200	33						
									21-64	1000	43						
									28-64	1030	52						
									15-65	1230	35						
									16-65	1530	34						
									26-65	1430	49						
July			August			September			October			November			December		
7-50	1200	68	8-50	1200	73	23-49	1330	62	6-50	1200	49	6-49	1000	39			
10-52	1745	62	6-52	1400	73	8-50	1100	58	2-52	0915	46	26-57	1300	32			
28-53	1500	75	5-53	1535	72	13-51	1330	56	21-54	1400	48	1-61	1455	33			
1-54	1400	55	16-55	1415	76	9-52	1800	72	4-61	1210	54	2-62	1120	40			
7-60	1620	80	20-62	1525	74	9-63	1300	70	2-62	1250	55	13-63	1040	32			
11-63	1045	77	1-63	1250	71	13-65	1525	54	17-63	1040	64	3-65	1230	37			
14-64	1500	71	5-64	1700	71												
			12-65	1130	82												

149. East Poplar River at international boundary (6-1785)

Location.--At gaging station, lat 49°00'00", long 105°24'30", in SW¼ sec.3, T.1, R.26 W., second meridian, on left bank 10 ft north of international boundary, 400 ft southwest of Canadian East Poplar Port of Entry, 14 miles upstream from mouth, and 14 miles north of Scobey, Mont. Datum of gage is 2,410.92 ft above mean sea level (International Boundary Surveys datum).

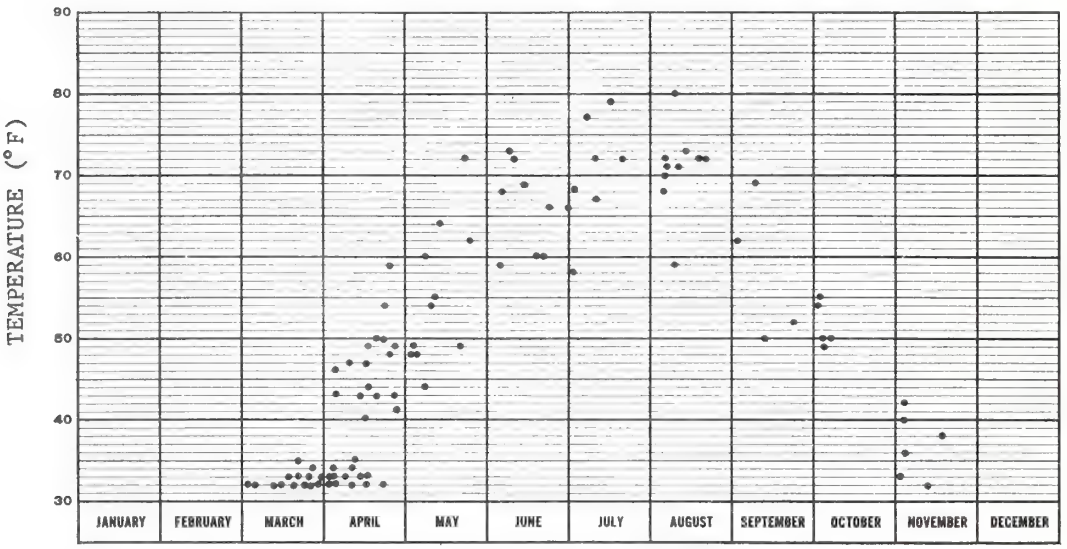
Drainage area.--534 sq mi.

Water temperature records available.--114 spot observations made at time of discharge measurements during period March 1949 to November 1965 (seasonal records only).

Extremes.--Discharge 1931-65: Maximum, 2,760 cfs Mar. 22, 1939; no flow at times.

Water temperatures 1949-65: Maximum observed, 80°F Aug. 12, 1965; minimum, freezing point on many days during winter months.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.



Spot observations of water temperatures, 1949-65

149. East Poplar River at international boundary (6-1785)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						31-49	1130	33	4-49	1730	34	11-49	1000	64	17-49	1400	60
						2-54	1635	32	14-49	1700	49	3-51	0900	49	23-50	1300	66
						31-58	1140	33	14-50	1830	32	8-52	1830	60	5-51	1800	59
						21-59	1820	32	25-50	1230	43	10-54	1355	54	19-52	0915	60
						24-59	1545	32	27-50	1000	41	11-60	0830	55	6-61	0830	68
						7-61	1410	32	5-51	1900	32	2-61	0805	48	11-62	1800	72
						13-61	1500	32	11-51	1700	32	8-62	1005	44	13-63	1210	69
						18-61	1200	33	13-51	1700	33	24-62	1800	62	30-64	0730	66
						28-61	1200	34	16-51	1145	32	7-63	1600	60	10-65	1610	73
						7-62	0930	32	23-51	1300	32	20-63	1530	49			
						26-62	1420	33	27-51	1800	49	4-64	1300	48			
						28-62	1540	32	5-52	1140	32	20-64	1630	72			
						6-63	0915	32	8-52	1830	33						
						12-63	0905	32	11-52	1050	35						
						20-63	0800	32	16-52	1230	47						
						22-63	1600	35	18-52	1000	50						
						23-63	1430	33	22-52	1110	50						
						24-63	1130	34	22-53	1330	50						
						26-63	1505	33	5-54	1330	33						
						27-64	0800	32	15-54	1215	40						
						30-64	1600	32	18-55	1500	43						
									3-58	1520	43						
									15-59	0900	44						
									6-60	1545	46						
									12-61	1420	47						
									1-62	1815	32						
									6-62	1300	34						
									24-62	1800	59						
									1-64	1440	33						
									2-64	1230	33						
									3-64	1400	34						
									13-64	1530	43						
									20-64	1600	54						
									27-64	1630	48						
									10-65	1230	34						
									14-65	1600	33						
									16-65	1400	33						
July			August			September			October			November			December		
7-50	1300	77	4-49	0800	68	23-49	1100	52	6-50	0930	49	5-49	1600	42			
10-52	1500	67	8-50	0830	59	9-63	1430	69	2-52	1115	54	17-54	1140	38			
1-54	1305	58	6-52	1200	72	2-64	1100	62	7-57	1310	40	1-61	1205	33			
1-58	1000	68	5-53	1200	70	13-65	1650	50	4-61	1410	50	2-62	1400	40			
7-60	1300	77	12-54	1700	71				2-62	1125	55	13-63	1330	32			
19-61	1500	72	17-55	1250	72							2-64	1520	42			
11-63	0745	72	14-58	1800	73							3-65	1105	36			
14-64	1400	79	20-62	1735	72												
			6-63	0910	71												
			5-64	1530	71												
			12-65	1330	80												

150. Poplar River near Poplar, Mont. (6-1810)

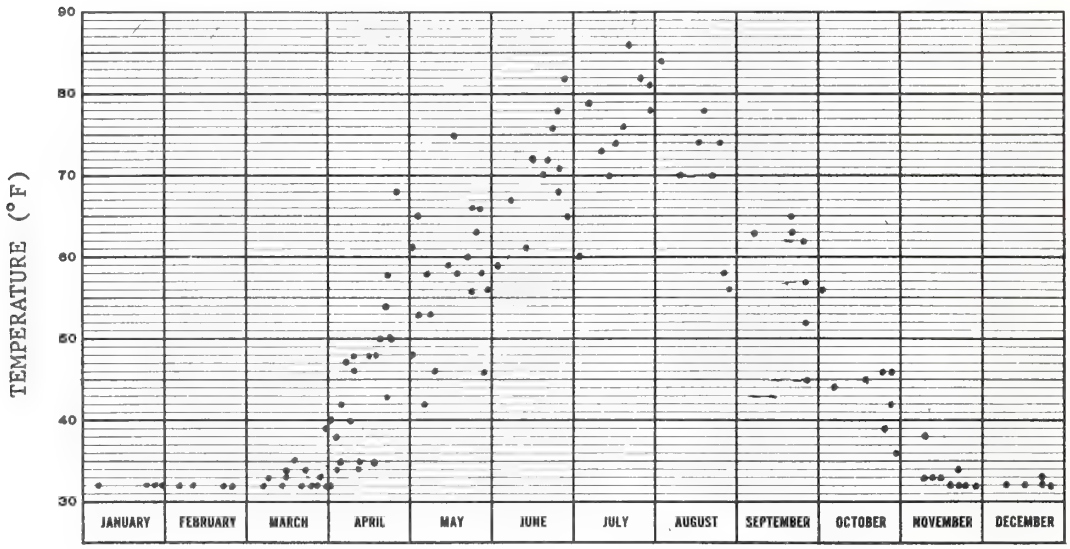
Location.--At gaging station, lat 48°10'10", long 105°10'40", in NE¼NE¼ sec.19, T.28 N., R.51 E., on right bank 4 miles north of Poplar and 11 miles upstream from mouth. Altitude of gage is 1,970 ft (from topographic map).

Drainage area.--3,174 sq mi.

Water temperature records available.--131 spot observations made at time of discharge measurements during period May 1949 to December 1965.

Extremes.--Discharge 1908-24, 1947-65: Maximum, 37,400 cfs Apr. 6, 1954; no flow at times. Flood of July 10, 1946, reached a discharge of 40,000 cfs at site 20 miles upstream.

Water temperatures 1949-65: Maximum observed, 86°F July 19, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

150. Poplar River near Poplar, Mont. (6-1810)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-57	1535	32	11-54	1235	32	14-61	1520	34	14-53	1225	34	6-49	1400	58	23-49	1500	72
31-61	1410	32	27-61	1525	32	16-61	1335	32	21-53	1815	50	4-50	1830	42	2-50	1600	59
31-62	1510	32	26-62	1200	32	31-61	1105	39	1-58	1530	40	1-51	1700	48	22-51	1500	70
29-63	1600	32	8-63	1135	32	27-62	1645	34	7-60	1600	47	2-51	1700	53	26-52	1500	68
28-64	1530	32	11-63	1230	32	28-62	1600	32	13-60	1410	48	21-51	1230	60	28-61	1300	82
			26-64	1530	32	29-62	1500	32	10-61	1345	48	2-52	1400	65	15-62	1155	61
			26-65	1145	32	30-62	1615	33	26-61	1535	43	26-52	1700	63	19-62	1120	72
						21-63	1330	33	2-62	1300	38	18-53	1500	75	26-62	1430	78
						25-63	1415	35	5-62	1630	42	1-57	1210	61	9-63	0900	67
						26-63	1310	35	9-62	1330	40	18-60	1950	58	26-63	1410	71
						26-64	1145	32	16-62	1140	48	24-60	1155	66	25-64	1700	76
						31-65	1045	32	23-62	1100	54	16-61	1700	59	28-65	1100	65
									27-62	1250	58	7-62	1100	46			
									3-63	1150	34	22-62	1050	56			
									17-63	1415	48	29-62	1200	56			
									1-64	1330	32	27-63	1510	58			
									2-64	1430	34	6-64	1210	53			
									5-64	1300	35	26-64	1530	66			
									13-64	1100	46	28-65	1440	46			
									20-64	1040	50						
									27-64	1100	50						
									12-65	1330	34						
									14-65	1100	35						
									16-65	1030	35						
									28-65	1330	68						
July			August			September			October			November			December		
12-49	1100	73	10-49	1400	70	9-49	1000	63	1-49	1000	56	17-49	1530	33	16-53	1105	32
18-50	1400	76	22-51	1400	70	20-50	1630	65	22-52	0930	45	16-50	1230	33	10-57	1540	32
15-52	1615	70	11-54	1330	70	20-60	1025	63	9-61	1210	44	19-52	1245	33	27-60	1515	32
2-54	1530	60	2-55	1530	84	29-61	1220	45	30-61	1420	36	16-54	1125	38	26-61	1330	32
6-55	1600	79	19-55	1300	78	27-62	1020	57	29-62	1210	46	30-56	1235	32	27-62	1300	32
19-60	1530	86	17-60	1500	74	27-63	1040	62	28-63	1400	39	28-60	1610	32	26-63	1130	33
26-61	1430	82	29-62	1005	58	29-64	1100	52	29-64	1100	42	30-61	1320	32			
16-63	1330	74	27-63	1445	74	28-65	1200	45	28-65	1300	46	27-62	1405	34			
28-64	1430	78	30-65	1100	56							26-63	1340	32			
28-65	1400	81										27-64	0930	32			

151. Big Muddy Creek at Daleview, Mont. (6-1825)

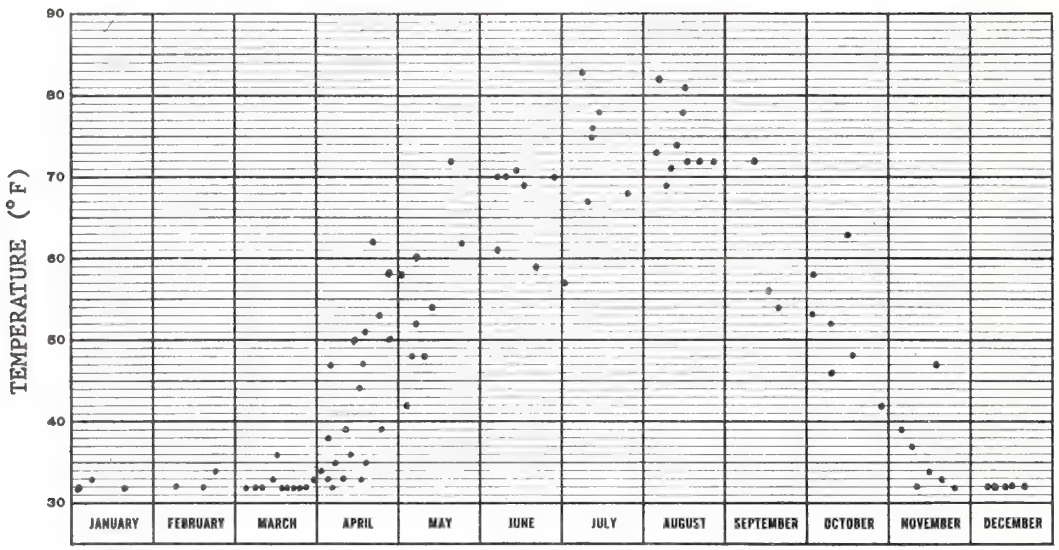
Location.--At gaging station, lat 48°55', long 104°57', near center of north line of sec.5, T.36 N., R.52 E., on right bank half a mile west of Daleview, half a mile upstream from Whitetail Creek, 6 miles north of Redstone, and at mile 149.6. Altitude of gage is 2,120 ft (by barometer).

Drainage area.--279 sq mi.

Water temperature records available.--99 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1947-65: Maximum, 6,360 cfs Apr. 7, 1952; no flow at times.

Water temperatures 1949-65: Maximum observed, 83°F July 7, 1950; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

151. Big Muddy Creek at Daleview, Mont. (6-1825)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
25-54	1230	32	8-54	1430	32	31-49	1600	33	4-49	1500	38	6-49	1000	52	17-49	1000	59
5-61	1225	33	25-58	1800	34	31-58	1730	33	15-49	1600	51	2-51	1630	42	6-51	1330	61
3-62	--	32	20-63	1415	32	6-61	1650	32	5-51	1530	32	8-52	1200	60	7-60	1245	70
2-64	1400	32				13-61	1200	32	9-51	1200	33	10-54	1200	54	6-61	1140	70
						20-61	1230	36	14-51	1130	33	1-61	1615	58	11-62	1700	71
						28-61	0940	32	21-51	1640	39	7-62	1730	48	13-63	1350	69
						27-62	1820	32	4-52	1545	33	24-62	1600	62	30-64	0900	70
						29-62	1815	32	10-52	1815	39	4-64	1530	48			
						12-63	1400	32	19-52	1820	62	20-64	1200	72			
						21-63	1420	32	5-54	1035	32						
						24-63	0730	32	15-54	1635	47						
						27-64	1310	32	6-60	1800	47						
						18-65	1055	33	12-61	1630	50						
									2-62	1750	34						
									6-62	1000	35						
									11-62	1150	36						
									24-62	1205	58						
									2-64	0930	34						
									13-64	1330	44						
									20-64	1400	53						
									27-64	1300	50						
									9-65	1130	33						
									15-65	0915	35						
July			August			September			October			November			December		
7-50	1530	83	4-49	1300	73	12-51	1600	56	12-51	1700	52	5-49	1100	39	10-57	1140	32
10-52	1230	67	7-50	1530	71	9-52	1400	72	2-52	1830	53	17-49	1000	33	7-60	1215	32
29-53	0815	68	6-52	0930	69	9-63	1530	72	30-52	1250	42	16-54	1625	47	6-61	1445	32
1-54	1055	57	12-54	1200	72	14-65	1000	54	21-54	1630	48	26-57	1530	32	9-64	1130	32
12-60	1145	78	18-55	1100	72				12-61	1230	46	8-61	1100	32	15-65	1100	32
11-61	1400	75	9-60	1615	78				2-62	1630	58	7-62	1350	37			
11-63	1330	76	8-61	1230	74				17-63	1700	63	12-63	1600	34			
			21-62	1000	72												
			5-63	1545	82												
			12-65	1545	81												

152. Missouri River near Culbertson, Mont. (6-1855)

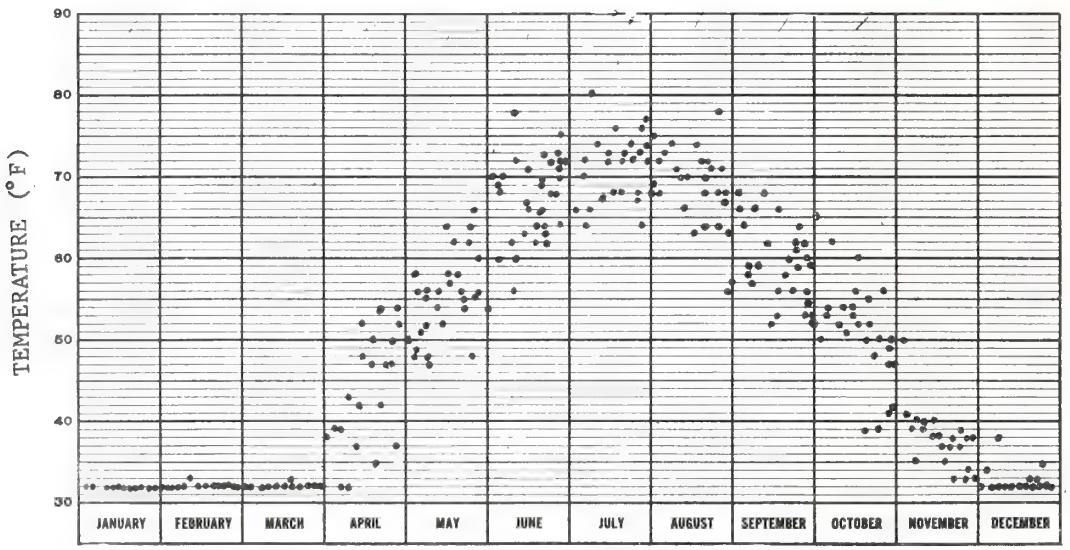
Location.--At gaging station, lat 48°07'20", long 104°28'20", in E½NW¼ sec.3, T.27 N., R.56 E., on left bank 580 ft downstream from bridge on State Highway 16, 3 miles southeast of Culbertson, 10 miles downstream from Big Muddy Creek, and at mile 1,620.76. Datum of gage is 1,883.4 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Drainage area.--91,557 sq mi.

Water temperature records available.--309 spot observations made at time of discharge measurements during the periods April 1949 to December 1951, May 1958 to December 1965. Once-daily observations July to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1941-51, 1958-65: Maximum, 78,200 cfs Mar. 26, 1943; minimum daily, 575 cfs Nov. 22, 1941.

Water temperatures 1949-51, 1958-65: Maximum observed, 80°F July 8, 1963; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-51, 1958-65

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1965	Max	--	--	--	--	--	--	69	67	56	52	47	38
	Min	--	--	--	--	--	--	62	53	44	46	32	32

152. Missouri River near Culbertson, Mont. (6-1855)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-61	1645	32	6-61	1510	32	7-61	1430	32	13-49	1500	52	4-49	1600	51	4-49	1200	68
23-61	1735	32	13-61	1735	32	15-61	1410	32	19-49	1630	47	9-49	1400	55	15-49	1000	67
30-61	1455	32	22-61	1030	32	6-62	1630	32	29-49	1500	54	14-49	1230	56	20-49	0930	63
2-62	1410	32	28-61	1440	32	13-62	1715	32	7-60	1800	43	19-49	1500	58	24-49	1400	72
9-62	1600	32	6-62	1315	32	20-62	1130	32	14-60	1030	47	25-49	1500	66	29-49	0900	70
15-62	1500	32	13-62	1625	32	28-62	1250	32	18-60	1735	47	9-50	1900	47	5-50	1230	69
29-62	1635	32	20-62	1650	32	7-63	1330	32	26-60	1930	37	15-50	1730	52	10-50	1430	56
2-63	1445	32	27-62	1650	32	11-63	1545	32	5-61	1000	39	20-50	1900	55	19-50	1800	64
7-63	1500	32	4-63	1725	32	18-63	1300	32	10-61	1650	42	26-50	1200	60	30-50	1100	72
14-63	1700	32	13-63	1615	32	2-64	1500	32	17-61	1725	42	31-50	2000	54	5-51	1600	60
21-63	1700	32	18-63	1635	32	1-65	1430	32	4-62	1215	39	16-51	1430	57	12-51	1030	63
6-64	1610	32	25-63	1650	32	15-65	1515	33	10-62	1650	42	2-58	1200	58	15-51	1730	71
13-64	1550	32	3-64	1415	32	22-65	1430	32	16-62	1615	50	3-60	1000	48	22-51	1500	64
20-64	1700	32	10-64	1500	33	29-65	1500	32	23-62	1600	54	10-60	1000	56	26-51	1300	68
27-64	1615	32	17-64	1545	32				30-62	1745	52	16-60	1230	64	13-60	1030	66
11-65	1515	32	24-64	1600	32				1-63	1430	38	24-60	1430	64	20-60	1905	66
18-65	1520	32	1-65	1445	32				8-63	1530	37	1-61	1730	50	29-60	1415	72
25-65	1445	32	8-65	1430	32				6-64	1500	32	15-61	1815	58	1-61	1305	70
			15-65	1415	32				13-64	1635	48	23-61	1530	62	6-61	1115	70
			23-65	1445	32				20-64	1530	52	7-62	1300	51	12-61	1745	78
									27-64	1610	50	14-62	1315	54	19-61	1700	70
									5-65	1530	32	21-62	1430	54	26-61	1730	73
									20-65	1545	35	28-62	1200	56	11-62	1430	72
												6-63	1340	56	19-62	1650	69
												20-63	1430	56	26-62	1200	71
												27-63	1300	55	3-63	1510	68
												6-64	1130	52	11-63	1300	60
												11-64	1115	52	18-63	1600	73
												19-64	0905	62	25-63	1250	68
												25-64	1500	62	8-64	1530	62
												3-65	1330	49	15-64	1100	62
												10-65	1715	48	23-64	1050	64
												24-65	1700	48	29-64	1205	75
															21-65	1130	62
															28-65	1300	64

152. Missouri River near Culberton, Mont. (6-1855)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
6-49	1000	66	3-49	0930	68	7-49	0900	57	4-50	1000	53	14-50	1330	38	1-60	1337	32
11-49	1230	73	13-49	1200	72	13-49	1100	53	10-50	1400	51	7-51	1200	40	9-60	1300	32
16-49	0900	73	19-49	1200	70	28-49	0900	54	13-50	1430	56	29-51	1000	38	20-60	0915	32
21-49	1300	64	25-49	1000	64	3-50	1300	68	18-50	1430	50	15-60	1500	37	28-60	1625	32
27-49	0930	73	31-49	0900	57	13-50	1300	56	11-51	1130	53	22-60	1015	37	4-61	1320	32
5-50	1400	70	4-50	1200	73	29-50	1600	52	18-51	1800	39	6-61	1430	35	5-61	1200	32
15-50	1800	68	9-50	1415	66	5-51	1230	59	15-58	1430	50	13-61	1100	38	11-61	1630	32
20-50	2000	67	24-50	1400	68	10-51	1600	62	4-60	1615	54	20-61	1415	33	12-61	1600	32
26-50	1400	72	30-50	1400	68	20-51	1400	62	17-60	1620	48	27-61	1420	33	18-61	1400	32
17-51	1500	74	8-51	1500	70	7-60	1035	66	2-61	1500	50	5-62	1430	39	26-61	1500	32
5-60	1620	72	21-51	1130	63	13-60	1447	66	9-61	1645	54	13-62	1400	40	3-62	1410	34
11-60	1830	72	28-51	1200	62	19-60	1035	64	16-61	1315	55	19-62	1335	38	17-62	1340	33
25-60	1505	77	1-60	1615	75	26-60	1200	56	23-61	1450	41	26-62	1630	38	26-62	1400	32
5-61	1510	64	9-60	1135	70	5-61	1350	58	30-61	1200	42	4-63	1130	41	3-63	1220	34
10-61	1740	67	15-60	1225	71	11-61	1445	52	1-62	1330	65	18-63	1425	37	9-63	1200	32
17-61	1740	72	23-60	1345	64	18-61	1605	62	9-62	1030	52	26-63	1230	32	20-63	1630	32
25-61	1335	76	30-60	1715	64	25-61	1520	53	16-62	1345	52	9-64	1400	40	21-63	1010	32
3-62	0900	66	1-61	1145	69	4-62	1300	64	23-62	1115	47	30-64	1600	32	30-63	1500	33
9-62	1445	74	14-61	1700	72	18-62	1315	61	29-62	1400	49	1-65	1430	50	7-64	1545	32
17-62	1330	72	28-61	1630	68	24-62	1130	59	7-63	1110	62	9-65	1310	39	14-64	1625	32
31-62	1310	68	7-62	1505	71	3-63	1120	66	14-63	1330	60	16-65	1600	35	28-64	1545	32
8-63	1600	80	13-62	1415	72	9-63	1120	68	21-63	1200	56	22-65	1530	39	6-65	1500	38
15-63	1035	72	20-62	1040	68	16-63	1050	56	28-63	1250	42				13-65	1430	33
22-63	1400	76	29-62	1110	63	23-63	1230	60	12-64	1420	52				20-65	1425	35
29-63	1245	74	5-63	1045	74	30-63	1030	60	26-64	1040	47				27-65	1200	32
13-64	1145	76	12-63	1600	74	8-65	1200	59	4-65	1345	53						
12-65	1430	68	19-63	1035	71	14-65	1215	58	11-65	1430	54						
20-65	0945	68	26-63	1430	78	21-65	1200	53	18-65	1450	50						
			3-64	1150	72				25-65	1545	50						
			11-64	0910	63												
			3-65	1145	72												
			17-65	0805	68												
			24-65	1345	70												
			30-65	1500	56												

153. Gardner River near Mammoth, Yellowstone National Park (6-1910)

Location.--At gaging station, lat 44°59'35", long 110°41'25", on left bank at Wyoming-Montana state line, 400 ft upstream from highway bridge, half a mile downstream from Hot River (formerly Boiling River), 1½ miles north of Mammoth, and 3 miles upstream from mouth. Altitude of gage is 5,620 ft (from topographic map).

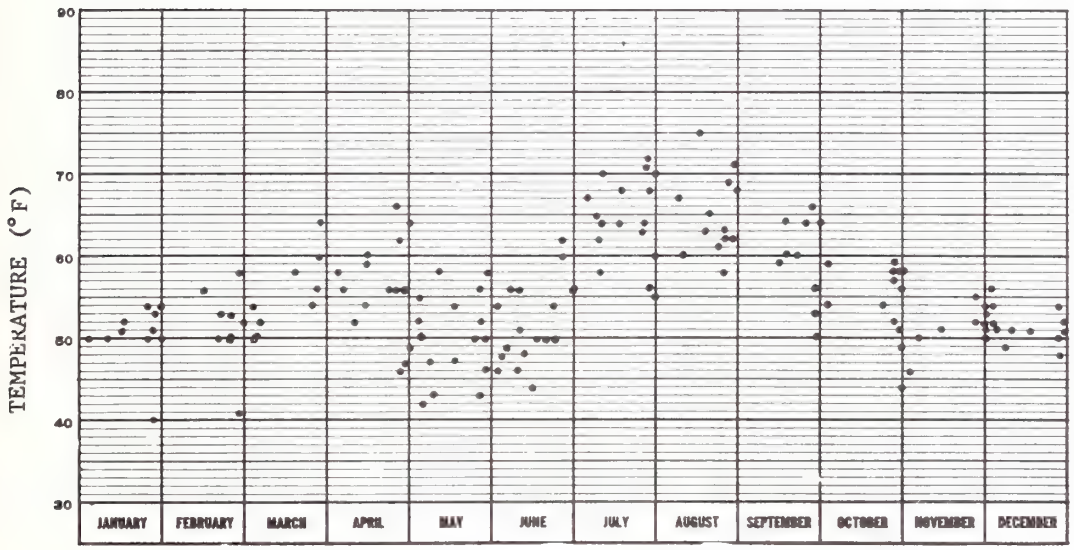
Drainage area.--202 sq mi.

Water temperature records available.--168 spot observations made at time of discharge measurements made during period December 1948 to December 1965.

Extremes.--Discharge 1938-65: Maximum, 2,080 cfs June 4, 1956; minimum, 35 cfs Mar. 28, 1942.

Water temperatures 1948-65: Maximum observed, 75°F Aug. 16, 1958; minimum, 40°F Jan. 27, 1951.

Remarks.--Water temperatures affected by thermal springs in the vicinity of Mammoth.



Spot observations of water temperatures, 1948-65

153. Gardner River near Mammoth, Yellowstone National Park (6-1910)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
27-51	1710	40	15-50	1545	56	7-51	1705	52	22-49	1135	56	4-49	1825	50	7-49	1105	51
25-53	1600	54	20-52	1100	53	4-53	1420	50	24-51	1400	56	17-50	1045	47	23-50	1620	50
14-54	1530	52	20-54	1540	53	25-54	1855	54	3-52	1630	58	10-52	1000	43	9-53	2000	56
9-55	1055	50	21-55	1455	50	4-57	1310	54	14-53	1600	59	5-53	1600	42	11-54	1030	48
14-56	1600	51	24-56	1800	50	5-58	1700	50	30-54	1135	49	24-54	1300	50	14-55	1330	50
27-57	1350	50	27-59	0830	41	29-60	1440	56	7-55	1900	56	2-55	1000	52	20-56	1000	50
25-58	1100	50	28-61	1210	52	29-61	1300	64	29-56	1940	47	29-55	1330	58	12-57	1500	51
14-59	1500	52	28-62	1300	52	29-63	1420	60	13-57	1030	54	25-56	0800	43	3-58	0815	48
28-60	1000	51	27-63	1540	58	24-64	1700	54	12-58	0900	54	4-57	1245	55	11-59	1500	51
31-61	0955	54	26-64	1800	50	18-65	1640	58	10-59	0900	52	8-58	0800	47	1-60	1500	54
3-62	1045	50	24-65	1430	53				28-60	1330	56	15-59	1240	54	1-61	0950	46
31-62	1150	54							27-61	1240	62	29-62	0940	46	30-61	0840	56
31-63	1355	50							26-62	1330	46	29-63	1240	50	14-62	1945	46
29-64	1450	53							24-63	1510	66	27-64	1430	56	27-62	1855	60
28-65	0935	50							30-64	1430	64	12-65	1635	58	18-63	0925	50
									14-65	1830	60	27-65	1530	52	18-63	1010	50
															27-63	1625	62
															11-64	1400	56
															11-65	1005	46
															22-65	1410	54
July			August			September			October			November			December		
6-49	1750	67	24-51	1030	58	15-49	1100	59	30-49	1010	56	13-51	1620	51	10-48	--	51
30-50	1200	55	11-53	1015	60	17-53	0930	64	25-50	1730	57	2-54	1800	46	14-49	1725	51
27-51	1755	64	26-54	0800	62	23-55	1740	60	21-53	0825	54	7-56	1445	50	6-52	1220	49
9-53	1730	65	19-55	0830	65	29-56	0930	53	1-54	1630	59	30-59	1345	53	2-53	1530	52
15-54	0930	64	24-56	0800	61	18-57	1605	60	28-55	1800	51	30-60	1220	50	1-54	0930	56
16-55	1430	68	9-57	1200	67	19-58	1000	60	25-57	1900	58	30-61	1650	51	1-55	1400	54
24-56	0930	63	16-58	1810	75	30-60	1215	64	28-58	1030	52	30-62	1500	52	4-56	1700	51
11-57	1200	64	30-60	1215	71	29-61	1210	53	4-59	1000	54	27-63	1400	55	10-57	1500	51
11-58	1400	70	31-61	1200	68	27-62	1700	64	30-59	0900	49	24-64	0840	52	3-58	1400	52
8-59	1425	62	28-62	1545	62	27-63	1205	66	31-60	1615	58	30-65	1200	54	30-60	1545	52
28-60	1230	72	27-63	1300	69	28-64	1200	56	30-61	1700	44				28-62	1525	48
28-61	1045	71	26-64	1650	63	28-65	1705	50	29-62	1405	58				28-63	1600	54
31-62	0745	60	18-65	1120	63				29-63	1345	58				29-64	1300	51
11-63	1050	58							28-64	1450	59				28-65	1415	50
29-63	1740	68															
30-64	1430	70															
28-65	0840	56															

154. Yellowstone River at Corwin Springs, Mont. (6-1915)

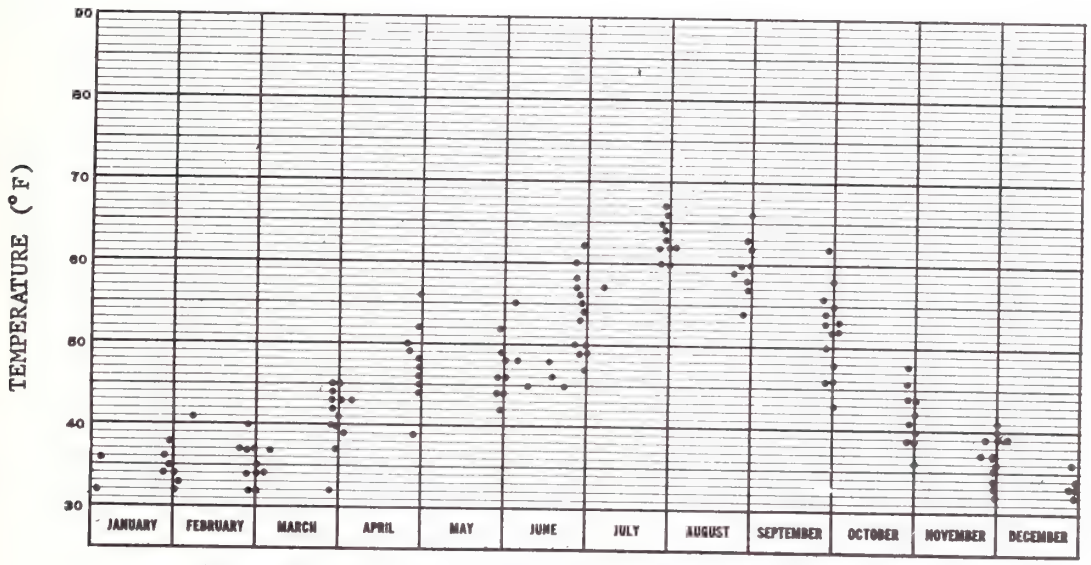
Location.--At gaging station, lat 45°06'40", long 110°47'40", in SE¼NW¼ sec.30, T.8 S., R.8 E., on left bank 20 ft downstream from highway bridge at Corwin Springs, 1½ miles upstream from Mol Heron Creek, 7 miles northwest of Gardiner, and at river mile 530.5. Datum of gage is 5,079.09 ft above mean sea level, datum of 1929, supplementary adjustment of 1940.

Drainage area.--2,623 sq mi.

Water temperature records available.--161 spot observations made at time of discharge measurements during period April 1949 to December 1965, including 8 observations made at time of water quality sampling.

Extremes.--Discharge 1889-93, 1910-65: Maximum observed, 32,000 cfs June 14, 15, 1918; minimum observed, 389 cfs Feb. 23, Mar. 5, 9, 1937.

Water temperatures 1949-65: Maximum observed, 67°F July 30, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

154. Yellowstone River at Corwin Springs, Mont. (6-1915)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-53	1200	35	2-52	1000	33	1-50	1100	34	26-49	1530	49	31-50	1900	44	22-50	1400	45
27-55	1530	34	26-53	0945	34	1-52	1030	34	28-50	1200	39	29-52	0650	46	11-52	0715	45
29-59	1130	38	28-55	1700	34	30-52	1130	42	30-52	1240	44	28-54	1550	42	29-52	1230	54
31-61	1100	34	28-56	1115	37	29-53	1400	37	30-53	1100	44	31-56	0930	48	30-54	1130	49
2-62	1310	32	27-59	1000	37	31-55	1230	43	1-54	1200	39	28-59	1030	44	28-55	1330	53
31-62	0930	32	28-61	1015	35	28-57	1130	43	29-54	1300	44	31-60	1330	46	4-56	1530	48
3-63	0950	36	28-62	1600	32	1-58	1500	34	29-55	1100	45	31-61	1435	44	26-56	1130	60
29-64	1555	35	7-63	1525	41	28-58	1100	40	29-57	1650	56	29-62	1145	52	27-57	1230	49
27-65	1610	36	26-63	1605	40	30-59	1630	43	30-58	1000	44	29-63	0940	42	27-58	0830	56
			27-64	1100	32	30-60	1210	41	29-59	1000	47	29-64	1200	54	29-59	1530	50
			24-65	1225	37	30-61	0915	40	29-60	1030	46	27-65	0905	42	28-60	1110	55
						7-63	0935	37	28-61	1020	47				29-61	1615	62
						28-63	1610	44	26-62	1545	50				28-62	1000	50
						25-64	1730	32	4-63	1220	43				16-63	1655	48
						30-65	1430	45	29-64	1115	52				26-63	1720	52
									29-65	1225	48				4-64	1200	55
															15-65	1510	46
															29-65	1805	47
July			August			September			October			November			December		
30-53	1330	67	30-51	1115	58	28-51	1300	50	31-51	1100	36	30-50	1205	41	31-52	1130	34
30-54	1500	62	1-52	0950	62	30-54	1200	46	1-52	0845	52	30-51	1030	39	30-53	1200	32
29-55	1200	63	29-52	0925	58	30-55	1200	48	31-52	1030	42	30-52	1100	32	29-54	1230	32
5-56	1345	57	31-53	1400	60	28-56	1630	54	29-54	1030	41	30-53	1330	40	31-58	1130	33
30-56	1630	66	31-54	1800	62	30-57	1500	58	31-55	1500	42	30-54	1230	32	31-60	1015	32
30-57	1000	60	31-55	1300	66	29-58	1000	52	1-56	1420	53	30-55	1400	32	3-62	1500	39
29-58	1500	65	28-56	1500	63	30-59	1300	43	31-57	1100	44	29-56	1230	35	29-62	1520	32
30-59	0930	62	30-57	1130	60	30-60	1300	55	30-58	1000	39	29-57	1200	33	29-63	1200	36
29-60	0900	64	30-60	0900	57	29-61	1410	46	30-59	1600	41	29-58	1200	32	29-64	1130	32
28-61	0935	64	31-61	0910	60	27-62	1230	56	31-60	1415	40	30-59	1100	36	28-65	1600	33
30-62	1815	60	29-62	0940	54	27-63	1500	62	31-61	0945	39	30-60	1315	33			
29-63	1555	62	27-63	1540	63	28-64	1430	53	29-62	1220	48	30-61	1055	37			
30-64	1130	64	26-64	1445	60	28-65	1100	46	29-63	1650	44	30-62	1050	34			
28-65	1130	62	25-65	1000	59				28-64	1150	46	27-63	1610	39			
												23-64	1600	37			
												30-65	0815	32			

155. Mill Creek near Pray, Mont. (6-1920)

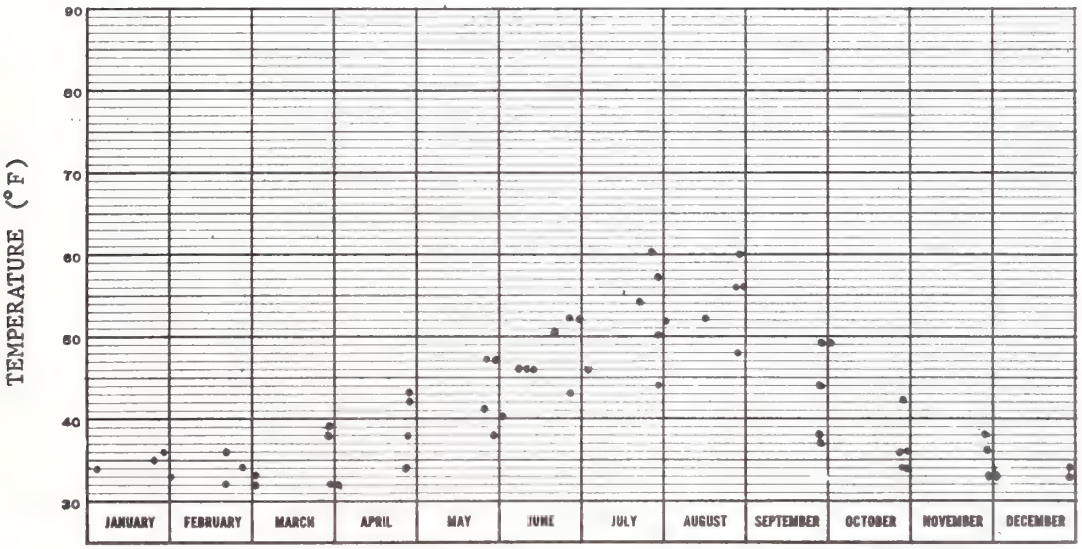
Location.--At gaging station, lat 45°21'35", long 110°37'00", in SW¼NE¼ sec.33, T.4 S., R.9 E., on downstream side of left abutment of private bridge, a quarter of a mile downstream from Davis Creek, 3½ miles southeast of Pray, and 4½ miles upstream from mouth. Altitude of gage is 5,160 ft (from topographic map).

Drainage area.--148 sq mi.

Water temperature records available.--59 spot observations made at time of discharge measurements during period May 1951 to September 1956.

Extremes.--Discharge 1951-56: Maximum, 2,300 cfs June 6, 1952; minimum observed, 3.9 cfs Nov. 9, 1952, Feb. 9, 1953.

Water temperatures 1951-56: Maximum observed, 60°F Aug. 31, 1954, July 27, 1955; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-56

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
6-52	1200	34	1-52	1620	33	1-52	1600	32	30-52	0930	38	31-51	1030	38	19-51	1530	50
29-53	1400	36	26-53	1400	36	30-52	1255	38	30-53	1300	42	28-52	1500	47	10-52	1355	46
27-55	1730	35	26-54	0830	32	29-53	1630	39	1-54	0830	32	27-54	1730	41	13-53	1800	46
			28-56	1345	34	1-55	1100	33	29-54	0900	34	31-56	1230	47	16-53	1800	46
						31-55	0900	32	29-55	1400	43				30-53	1600	52
									30-56	1700	42				1-55	1600	40
															27-55	0900	43
															25-56	1530	52
July			August			September			October			November			December		
31-51	0840	44	30-51	0900	48	28-51	0845	38	31-51	1230	36	29-51	1700	38	31-52	1400	34
2-52	1045	46	1-52	1055	52	29-53	1800	49	1-52	1325	49	30-52	1300	33	1-54	1000	33
31-53	1130	57	28-52	1320	56	30-54	0900	37	29-53	1430	42	30-53	1530	36	30-54	0930	33
20-54	1000	50	15-53	1030	53	29-55	1730	44	29-54	1300	36						
27-55	1530	60	31-53	1630	56	28-56	1400	44	31-55	1700	34						
24-56	1130	54	31-54	1400	60												
			30-55	1730	56												

156. Yellowstone River near Livingston, Mont. (6-1925)

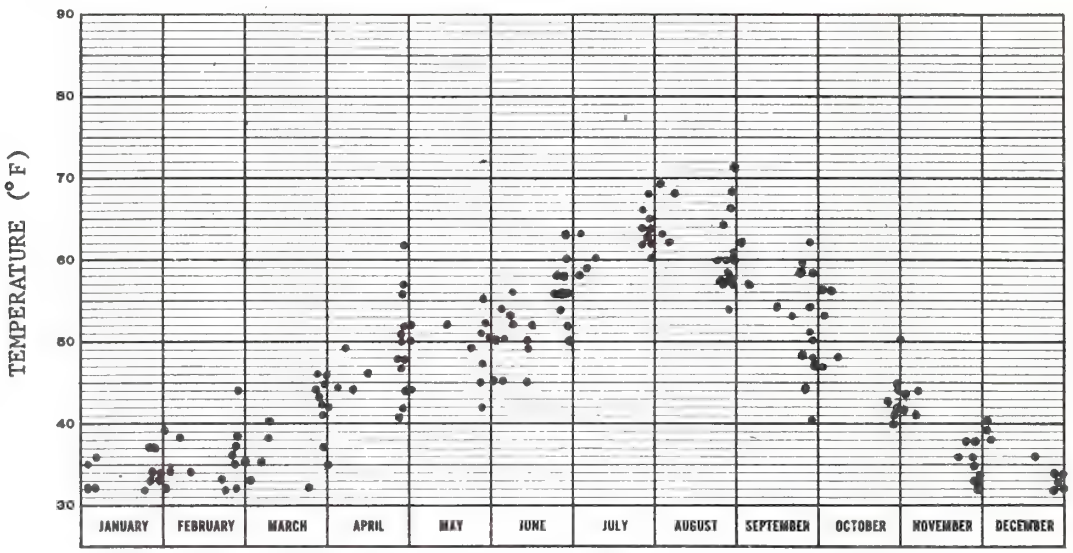
Location.--At gaging station, lat 45°35'50", long 110°33'55", in NW¼NW¼ sec.12, T.3 S., R.9 E., on right bank 50 ft downstream from bridge on U. S. Highway 89, 2 miles downstream from Suce Creek, 4 miles south of Livingston, and at mile 481.3. Datum of gage is 4,542.49 ft above mean sea level, datum of 1929.

Drainage area.--3,551 sq mi.

Water temperature records available.--190 spot observations made at time of discharge measurements including 28 observations made at time of water quality sampling.

Extremes.--Discharge 1897-1905, 1928-32, 1938-65: Maximum observed, 30,600 cfs June 20, 1943; minimum daily, 590 cfs Jan. 22, 1940.

Water temperatures 1949-65: Maximum observed, 71°F Aug. 31, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

156. Yellowstone River near Livingston, Mont. (6-1925)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
6-52	1000	33	28-50	1000	44	2-52	1100	33	11-50	1000	44	16-50	1830	52	11-52	1500	52
29-53	1700	35	2-52	1500	34	29-52	1730	41	27-50	1600	41	1-52	1545	52	29-53	1800	56
27-55	1030	32	26-53	1615	36	30-53	0830	37	30-53	1530	44	25-52	1645	49	1-55	1200	45
30-56	1530	32	27-56	1800	35	31-54	1630	35	27-54	1700	50	1-56	1100	44	28-55	1800	58
29-59	1430	37	27-59	1300	37	1-55	1500	33	28-55	1700	44	31-56	1700	50	4-56	1130	50
27-60	1600	37	11-62	1440	32	31-55	1600	46	29-57	1400	57	28-57	1700	42	25-56	1230	58
31-61	1355	34	27-62	1645	32	28-56	1800	42	30-58	1245	52	28-59	1600	47	27-57	1630	54
4-62	0945	32	7-63	1620	38	28-57	1500	43	29-59	1300	47	29-62	1410	52	27-58	1100	56
3-63	0840	35	11-63	1530	34	28-58	1430	46	27-60	0920	41	28-63	1805	51	29-59	1130	52
28-64	1645	32	28-63	0910	38	30-59	1330	43	6-61	1510	48	28-64	1600	55	2-60	1000	50
6-65	0810	36	25-64	1100	32	10-60	0900	40	27-61	1755	48	26-65	1625	45	28-60	1350	60
27-65	1400	34	1-65	1625	39	1-61	0925	35	27-62	0905	42				28-61	1530	63
			24-65	0930	33	30-61	1155	45	4-63	1325	44				14-62	1800	49
						7-63	1040	38	9-63	1715	50				27-62	1500	58
						28-63	1310	44	29-63	1755	56				4-63	1400	45
						24-64	1400	32	29-64	1500	62				16-63	1320	52
						5-65	0900	35	9-65	1310	49				26-63	1500	56
						31-65	0900	42	15-65	1230	46				12-64	1200	56
									26-65	1430	51				4-65	1455	54
															10-65	1545	53
															15-65	0900	45
															15-65	1645	50
															29-65	1355	50
July			August			September			October			November			December		
2-52	1730	58	30-50	1100	57	26-49	1500	58	30-51	1730	40	30-50	1700	34	31-52	1600	34
31-52	1730	64	2-51	0845	63	29-50	1615	40	1-52	1810	56	29-51	1530	38	1-53	1000	39
30-53	2030	63	29-51	1715	54	27-51	1630	44	29-54	1500	41	30-52	1530	32	27-56	1530	34
27-54	1700	64	25-52	1535	64	1-53	0900	62	31-57	1400	45	30-54	1600	32	30-57	1200	33
29-55	1630	65	31-54	1130	71	30-54	1600	47	30-58	1230	42	1-55	1700	42	31-58	1500	32
30-56	1230	68	29-55	1530	66	29-55	1600	48	2-62	0825	47	30-55	1000	32	23-59	1500	36
30-57	1400	62	30-57	1400	61	28-56	1230	51	31-62	1025	44	28-56	1700	36	29-60	1450	33
29-58	1200	62	8-58	1500	68	30-57	1800	58	2-63	0930	53	29-57	1500	33	3-62	1610	38
10-59	1600	60	31-60	1025	58	29-58	1300	50	30-63	1630	42	28-59	1200	35	28-62	1220	32
30-59	1230	63	30-61	1450	68	21-59	1500	53	7-64	0830	48	1-60	1505	42	29-63	1425	34
27-60	1400	66	29-62	1250	58	29-60	1500	54	27-64	1635	43	29-60	1030	32	2-64	1345	40
27-61	1530	66	6-63	0925	62	28-61	1235	62	4-65	1450	56	29-61	1415	36	29-64	0835	33
31-62	1115	60	28-63	1100	60	4-63	0905	57				8-62	1210	41	27-65	1525	32
2-63	1605	63	26-64	1000	57	26-63	1710	59				29-62	1555	38			
30-63	1440	64	2-65	1625	69	18-64	1415	54				26-63	1510	38			
6-65	1655	59	24-65	1740	60	27-65	1540	48				6-64	0915	44			
28-65	1515	62										23-64	1200	36			
												1-65	1515	50			
												29-65	1445	36			
												29-65	1630	33			

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.

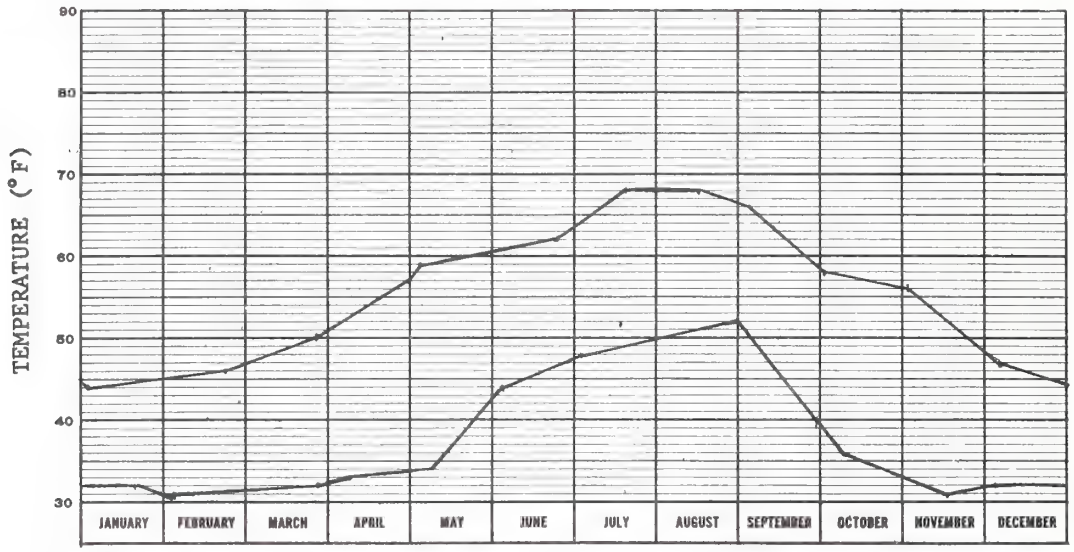
Location.--Lat 45°38'50", long 110°33'50", in NE¼SW¼ sec.24, T.2 S., R.9 E., at city water works at Livingston. Altitude of gage is 4,480 ft (from topographic map).

Water temperature records available.--Twice-daily observations made during period April 1953 to December 1965.

Extremes.--Water temperatures 1953-65: Maximum observed, 68°F July 18, 19, 1955, Aug. 15, 1958; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures are taken at approximately 0800 and 1700 hours daily.

Cooperation.--Records furnished by city of Livingston.



The lines connect the highest and lowest monthly temperatures from twice-daily observations, 1953-65

Summary of twice-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1953	Max	--	--	--	54	57	56	65	65	61	54	56	42
	Min	--	--	--	38	34	44	50	55	50	43	35	32
1954	Max	40	42	45	53	56	56	66	64	62	54	46	40
	Min	32	33	33	33	38	45	53	53	46	38	33	33
1955	Max	38	38	41	53	56	57	68	66	66	53	44	41
	Min	33	33	33	35	42	44	48	57	40	40	33	33
1956	Max	40	37	48	53	54	58	67	66	60	54	44	38
	Min	33	33	33	37	41	47	52	52	50	38	32	32
1957	Max	36	42	48	57	57	58	64	66	62	58	47	41
	Min	33	33	33	37	47	45	53	56	48	43	31	33
1958	Max	39	46	48	54	58	61	65	68	62	54	46	42
	Min	33	33	36	37	44	49	54	55	46	43	33	33
1959	Max	40	38	47	51	55	56	66	66	60	50	49	47
	Min	33	31	38	41	44	47	51	54	43	36	34	32
1960	Max	44	40	50	53	55	60	67	67	62	54	44	41
	Min	33	33	33	41	46	50	57	53	51	41	33	33
1961	Max	39	44	50	52	57	62	67	66	60	52	44	42
	Min	33	36	36	40	46	48	58	58	48	38	33	33
1962	Max	40	40	43	54	59	57	65	64	59	54	49	42
	Min	33	34	34	40	40	45	55	53	50	44	37	33
1963	Max	37	42	47	55	54	58	64	66	62	58	48	40
	Min	33	33	36	40	43	44	53	56	54	46	38	34
1964	Max	37	38	44	53	56	55	65	64	58	52	48	42
	Min	34	33	33	36	44	47	52	52	48	46	35	33
1965	Max	40	42	42	50	55	51	64	65	56	56	50	46
	Min	34	33	32	34	44	49	50	56	45	--	--	--
Extremes for years, 1954-65													
	Max	44	46	50	57	59	62	68	68	66	58	56	47
	Min	32	31	32	33	34	44	48	52	40	36	31	32

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), April to December 1953

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....																																
Minimum.....																																
February																																
Maximum.....																																
Minimum.....																																
March																																
Maximum.....																																
Minimum.....																																
April																																
Maximum.....	42	42	40	42	48	44	41	40	40	44	44	44	42	44	44	46	44	46	48	46	52	50	54	49	52	52	54	52	49	52	-	46
Minimum.....	40	40	40	42	46	44	41	38	38	38	40	42	40	41	41	44	40	40	42	44	48	49	52	46	46	49	50	50	46	45	-	43
May																																
Maximum.....	49	48	52	54	57	56	55	54	46	45	42	44	40	48	54	54	54	54	50	52	50	44	48	50	50	50	56	--	48	46	51	50
Minimum.....	46	44	45	47	48	50	52	48	46	44	34	38	38	44	46	49	40	41	42	49	46	37	43	47	37	48	52	--	46	44	46	45
June																																
Maximum.....	53	51	46	46	48	49	50	50	52	54	--	49	49	50	49	50	53	51	50	47	46	52	49	50	49	48	49	52	46	56	-	50
Minimum.....	48	49	46	44	47	48	44	47	46	48	--	48	48	47	47	47	48	50	50	46	45	46	46	49	46	46	47	48	40	51	-	47
July																																
Maximum.....	52	55	55	58	56	59	60	59	61	60	60	61	63	63	63	62	63	63	64	64	64	63	64	63	65	62	63	65	63	63	62	61
Minimum.....	50	50	51	51	53	53	54	54	54	55	56	57	58	59	60	59	59	58	60	60	58	58	60	60	60	60	60	61	61	61	60	57
August																																
Maximum.....	63	60	62	62	63	63	65	63	63	64	60	62	61	62	62	62	63	63	64	63	63	64	62	60	60	61	60	60	61	61	62	62
Minimum.....	60	57	58	59	59	59	60	60	59	60	57	58	59	58	58	58	59	59	59	60	59	60	60	58	55	56	56	59	56	56	58	58
September																																
Maximum.....	61	57	56	56	56	55	58	59	60	60	60	60	60	59	60	58	57	57	56	54	55	56	55	56	54	54	35	54	54	54	-	57
Minimum.....	58	54	54	54	53	53	54	54	54	55	55	55	56	56	54	55	55	53	55	52	51	53	53	53	52	50	52	52	50	50	-	54
October																																
Maximum.....	--	--	52	52	52	52	52	54	53	53	52	53	52	53	53	54	52	50	50	50	48	47	43	45	46	45	46	47	--	49	48	50
Minimum.....	--	--	47	47	45	47	47	49	50	53	50	50	49	49	50	50	50	48	48	48	46	44	43	44	45	44	44	45	--	47	46	47
November																																
Maximum.....	48	56	45	45	45	45	45	42	43	44	45	47	46	46	47	47	45	40	40	37	38	38	39	39	41	42	41	42	42	43	-	43
Minimum.....	46	46	43	42	44	44	43	41	41	40	42	44	43	44	45	45	43	39	37	35	36	37	38	38	39	40	40	40	41	41	-	41
December																																
Maximum.....	42	41	40	38	36	37	37	34	34	34	34	34	34	35	37	36	37	37	38	39	38	36	34	34	34	34	34	35	35	36	35	36
Minimum.....	41	40	38	37	35	35	35	34	33	33	34	33	33	34	36	35	36	36	37	38	36	35	34	33	33	32	33	34	35	34	33	35

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1954

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	35	35	35	34	35	37	40	38	36	35	33	33	35	33	33	33	34	34	33	33	34	36	35	33	33	34	36	38	36	35	38	35
Minimum.....	34	34	34	33	34	36	38	38	36	34	33	33	33	33	33	33	33	33	33	33	32	35	33	33	33	33	34	35	35	34	35	34
February																																
Maximum.....	38	38	38	39	38	38	39	38	40	38	35	37	40	40	40	39	39	42	37	37	38	38	42	42	42	42	40	38	-	-	-	39
Minimum.....	35	35	35	34	36	35	36	36	37	36	33	35	38	40	38	38	37	40	35	35	37	37	39	40	40	40	37	37	-	-	-	37
March																																
Maximum.....	35	34	35	35	35	35	41	42	45	45	41	38	37	36	36	38	38	42	45	44	42	45	44	40	41	42	40	34	38	38	37	39
Minimum.....	34	33	34	34	34	33	38	41	43	43	40	38	33	35	35	37	37	39	42	35	40	40	44	39	37	40	35	33	34	33	35	37
April																																
Maximum.....	37	37	42	48	50	48	47	47	45	41	40	49	48	50	51	53	50	52	49	47	48	50	53	53	50	50	51	47	46	44	-	47
Minimum.....	36	36	35	44	46	46	44	43	37	37	33	44	40	48	45	47	48	49	46	45	43	46	47	46	50	49	48	44	42	42	-	44
May																																
Maximum.....	41	45	44	50	56	54	50	51	53	53	52	49	51	50	53	53	53	54	53	51	52	43	47	50	51	50	46	44	48	48	48	50
Minimum.....	38	38	40	44	50	52	50	40	49	51	49	46	46	44	46	47	47	46	47	47	47	36	45	44	46	46	45	44	45	46	46	45
June																																
Maximum.....	46	47	48	56	51	48	47	50	49	49	49	49	53	52	52	50	47	48	53	53	54	54	54	53	54	53	54	51	51	53	-	51
Minimum.....	46	45	45	49	50	47	45	45	46	48	47	47	49	49	49	48	45	45	46	49	51	51	51	53	50	52	53	50	49	50	-	48
July																																
Maximum.....	54	58	58	60	57	60	61	61	60	61	64	64	65	63	63	63	64	66	65	64	62	63	63	63	63	64	64	63	62	63	63	62
Minimum.....	53	53	54	53	54	55	56	56	57	57	57	58	60	60	60	60	61	60	61	60	60	58	57	58	59	61	60	59	59	59	58	58
August																																
Maximum.....	64	64	64	64	62	60	60	63	62	61	63	61	60	62	60	60	61	61	60	60	58	57	58	60	60	58	60	61	61	60	61	61
Minimum.....	58	59	61	60	60	58	56	58	58	60	59	60	58	59	58	57	56	56	56	56	55	54	54	55	57	57	53	55	55	58	60	57
September																																
Maximum.....	62	62	59	59	58	57	57	57	59	56	57	60	60	60	59	57	56	54	53	53	52	55	55	54	56	54	55	52	48	47	-	56
Minimum.....	58	59	57	56	56	53	54	55	54	54	54	56	56	55	55	54	53	53	50	50	50	52	54	51	53	52	53	48	46	46	-	53
October																																
Maximum.....	46	50	53	46	49	50	50	54	51	50	48	46	46	45	45	47	48	48	49	49	48	51	48	42	42	44	42	43	41	43	45	47
Minimum.....	45	45	49	45	46	46	48	50	50	48	48	44	45	42	43	45	46	46	46	46	45	48	46	41	40	42	40	43	38	41	42	45
November																																
Maximum.....	44	42	43	43	45	45	44	42	42	43	44	43	46	45	46	46	--	44	44	43	44	45	45	44	45	42	41	39	35	34	-	43
Minimum.....	40	40	40	40	41	41	42	40	40	42	43	43	42	44	45	46	--	42	40	41	42	43	43	42	43	42	40	38	--	33	-	41
December																																
Maximum.....	34	35	38	39	38	40	39	36	35	34	34	34	34	35	34	36	33	33	35	33	35	36	36	36	34	33	33	34	33	34	34	35
Minimum.....	33	33	35	36	37	37	38	36	34	33	34	33	34	34	34	34	33	33	33	33	35	35	35	36	34	33	33	33	33	33	33	34

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1955

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	36	35	33	33	34	33	33	34	33	34	34	34	34	34	33	34	35	33	34	35	34	34	34	35	36	36	36	37	37	37	38	35
Minimum.....	34	33	33	33	34	33	33	33	33	33	33	34	34	33	33	33	34	33	33	33	33	34	34	35	35	36	35	34	34	35	36	34
February																																
Maximum.....	36	36	35	35	35	36	37	37	34	33	34	36	37	35	38	37	36	34	33	36	35	36	34	34	35	33	35	35	-	-	-	35
Minimum.....	35	34	34	34	34	34	33	35	34	33	33	34	34	34	36	34	34	33	33	33	33	34	33	34	34	33	33	33	-	-	-	34
March																																
Maximum.....	38	36	37	34	36	35	39	40	37	38	35	39	36	35	36	36	37	37	34	34	34	35	34	33	35	37	36	36	40	40	41	36
Minimum.....	33	34	35	34	34	34	34	34	34	36	35	35	35	35	35	34	35	34	34	33	33	33	33	33	33	33	33	33	35	38	41	34
April																																
Maximum.....	42	43	40	37	37	38	42	43	52	46	46	48	46	46	46	44	48	46	45	46	45	48	48	48	49	47	48	48	50	53	-	46
Minimum.....	41	42	38	36	35	37	40	40	44	46	42	46	44	44	43	42	42	44	44	42	44	46	44	46	46	47	46	46	44	46	-	43
May																																
Maximum.....	52	53	51	52	54	56	56	54	50	50	52	51	50	48	48	49	50	50	53	55	51	51	50	48	49	49	46	50	53	52	52	51
Minimum.....	50	50	49	48	50	51	50	52	48	42	48	48	49	48	45	46	48	47	50	50	49	47	46	47	46	47	46	44	46	--	48	48
June																																
Maximum.....	46	46	48	48	49	53	55	54	52	53	55	54	53	52	52	50	50	51	54	54	55	57	57	57	55	55	57	57	56	52	-	53
Minimum.....	44	45	47	45	47	47	50	53	50	46	48	49	47	48	47	49	48	48	49	49	50	52	52	52	53	50	51	53	53	50	-	49
July																																
Maximum.....	52	53	54	59	60	59	57	58	57	60	59	60	60	63	65	66	66	68	68	67	67	65	65	65	65	63	64	63	63	63	65	62
Minimum.....	50	48	50	54	57	55	54	51	53	55	58	57	56	58	59	61	62	63	63	65	65	62	62	63	62	61	60	61	62	62	64	58
August																																
Maximum.....	65	66	66	64	66	65	66	65	65	66	64	66	64	63	63	63	65	63	66	65	63	63	64	63	62	62	62	61	61	62	61	64
Minimum.....	62	62	62	60	60	60	62	62	61	61	61	60	61	60	59	60	59	60	60	60	60	60	58	59	59	58	59	58	57	57	57	60
September																																
Maximum.....	62	63	63	62	63	66	62	60	59	59	58	60	60	59	57	54	55	54	54	54	54	52	52	51	51	56	64	52	65	50	-	58
Minimum.....	59	57	59	58	57	62	57	57	55	53	54	56	56	56	54	53	54	53	53	53	49	49	50	48	47	49	47	50	40	49	-	53
October																																
Maximum.....	50	52	53	52	52	51	50	48	51	52	52	50	50	51	51	52	52	51	51	52	52	51	46	46	47	46	44	43	43	43	42	49
Minimum.....	49	48	50	50	51	49	48	47	48	49	50	49	49	48	48	48	47	48	50	50	49	49	44	44	45	44	43	42	41	42	40	47
November																																
Maximum.....	40	38	40	40	41	41	40	39	40	44	42	34	34	33	33	34	34	35	35	36	38	36	35	36	36	37	34	35	35	36	-	37
Minimum.....	37	36	37	40	40	38	37	37	39	40	36	33	33	33	33	33	33	34	34	36	37	35	35	35	35	35	33	33	33	34	-	35
December																																
Maximum.....	39	38	36	34	34	34	34	35	36	36	35	37	36	33	33	34	33	33	35	35	36	38	39	37	38	40	41	38	36	34	35	36
Minimum.....	36	36	33	34	34	34	34	34	34	34	34	35	34	33	33	33	33	33	33	35	36	34	38	36	34	38	39	37	34	33	33	35

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1956

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	34	35	34	36	38	38	37	37	36	36	37	37	40	40	37	34	34	34	36	36	37	37	39	38	35	34	34	33	34	34	34	36
Minimum.....	34	34	33	34	37	35	36	36	34	35	35	37	38	37	34	34	34	34	34	34	35	36	37	35	34	33	33	33	33	33	33	35
February																																
Maximum.....	33	34	34	34	35	35	35	35	34	34	35	36	35	35	34	34	34	33	34	34	36	36	36	35	34	35	35	36	37	-	-	35
Minimum.....	33	33	33	33	34	34	34	34	33	33	34	35	35	33	34	33	33	33	33	33	34	35	35	34	34	33	34	34	35	-	-	34
March																																
Maximum.....	37	39	38	38	38	37	37	35	36	36	33	33	34	37	36	38	43	44	44	44	44	44	47	47	48	47	42	43	44	43	42	40
Minimum.....	36	37	36	37	37	35	34	34	35	33	33	33	33	34	33	33	38	39	40	42	42	43	44	45	45	45	40	38	39	40	41	38
April																																
Maximum.....	42	42	44	43	45	44	44	46	49	50	48	50	52	52	52	52	50	49	50	53	52	52	46	46	46	45	44	45	46	48	-	48
Minimum.....	40	37	39	43	43	40	41	42	42	45	44	43	45	47	47	49	46	49	48	50	50	46	45	46	45	40	41	41	44	45	-	44
May																																
Maximum.....	48	47	47	43	47	49	50	51	51	51	50	47	47	48	50	54	54	54	51	50	50	49	50	49	49	49	49	49	50	49	50	49
Minimum.....	45	45	42	41	43	46	47	48	49	48	47	44	45	46	47	52	51	48	47	48	48	47	47	47	49	49	47	48	47	48	49	48
June																																
Maximum.....	51	50	50	50	50	49	48	52	52	52	53	52	58	53	54	53	51	54	56	55	55	54	54	54	54	56	57	57	57	58	-	53
Minimum.....	50	49	47	48	48	48	47	47	48	50	50	50	50	50	51	50	50	50	53	53	50	51	51	53	54	52	53	53	56	54	-	51
July																																
Maximum.....	57	56	54	54	55	59	59	60	60	61	61	61	61	62	61	61	62	62	63	64	66	66	66	66	66	66	64	63	67	66	65	62
Minimum.....	55	53	53	52	53	53	55	54	55	57	59	59	55	57	58	58	59	57	58	58	60	61	60	61	62	62	62	61	62	61	61	58
August																																
Maximum.....	65	64	63	62	62	62	62	62	60	62	61	63	64	64	64	64	66	63	59	63	64	64	64	63	62	61	60	57	58	54	57	62
Minimum.....	60	60	59	58	58	58	57	57	57	57	57	57	58	59	62	60	60	58	57	57	58	59	59	58	57	58	57	55	54	53	52	58
September																																
Maximum.....	56	59	58	57	54	58	57	58	60	60	57	58	59	58	58	58	58	59	59	59	57	55	54	55	55	54	55	53	51	52	-	57
Minimum.....	53	55	53	52	51	53	54	55	56	54	54	53	54	55	54	54	55	54	53	54	53	52	50	50	50	52	52	50	50	50	-	53
October																																
Maximum.....	53	53	54	53	53	53	54	53	51	52	52	52	52	50	50	49	50	50	49	48	47	46	45	45	44	43	44	44	42	40	40	49
Minimum.....	49	50	50	50	51	50	50	50	48	49	51	49	49	48	46	46	48	47	48	45	46	44	44	45	41	40	43	42	40	38	38	46
November																																
Maximum.....	39	37	36	36	38	40	42	43	42	43	44	44	44	40	37	40	37	38	36	37	34	34	36	36	36	36	36	36	35	36	-	38
Minimum.....	38	34	34	34	35	38	40	39	40	41	44	42	42	38	35	34	36	36	34	34	33	32	34	34	34	34	34	34	34	34	-	36
December																																
Maximum.....	36	37	38	38	34	33	33	33	33	34	34	34	36	36	36	36	36	36	37	36	35	35	34	33	33	34	34	35	35	36	36	35
Minimum.....	35	35	37	35	33	32	33	33	33	33	33	33	34	34	34	36	35	35	35	35	35	34	33	33	33	33	33	34	34	34	35	34

YELLOWSTONE RIVER BASIN

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1957

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	36	36	35	34	34	34	34	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	33		34
Minimum.....	33	35	34	33	33	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33		33
February																																
Maximum.....	33	33	33	33	33	33	35	36	35	36	36	37	37	38	37	37	38	38	36	33	33	33	35	36	36	37	40	42	-	-	-	36
Minimum.....	33	33	33	33	33	33	33	35	34	34	34	35	35	35	34	34	34	34	33	33	33	33	33	35	35	35	36	40	-	-	-	34
March																																
Maximum.....	43	42	42	40	37	33	40	42	43	42	39	40	38	39	40	40	41	45	46	46	45	40	42	43	42	43	45	46	45	48	48	42
Minimum.....	40	38	40	37	33	33	33	38	41	40	37	36	36	35	40	38	39	41	42	42	42	38	39	38	39	39	39	40	41	45	46	39
April																																
Maximum.....	47	44	48	47	45	44	45	46	49	49	42	41	43	45	47	49	49	46	50	52	54	53	53	48	47	48	50	50	57	57	-	48
Minimum.....	44	40	45	43	44	42	41	44	46	43	38	37	40	45	45	44	45	45	45	46	49	49	48	46	44	45	46	45	50	52	-	45
May																																
Maximum.....	56	56	55	55	56	53	51	52	50	49	49	49	50	50	50	49	50	51	51	50	46	47	50	53	53	54	55	57	51	51	50	52
Minimum.....	51	52	53	50	53	50	51	49	45	44	47	47	47	49	47	47	49	50	50	46	42	42	47	50	52	52	50	52	48	50	49	49
June																																
Maximum.....	51	52	52	52	51	51	52	52	51	52	51	50	50	49	49	47	49	49	51	51	52	53	52	53	--	53	53	57	58	58	-	52
Minimum.....	47	47	49	49	49	48	49	51	50	50	50	50	48	48	47	46	45	47	48	50	51	51	50	53	--	53	51	51	54	56	-	50
July																																
Maximum.....	57	54	57	55	58	58	59	59	55	61	62	61	62	63	64	64	63	60	60	61	62	64	64	64	63	63	62	64	64	63	64	61
Minimum.....	54	53	54	53	55	57	58	55	55	58	60	59	59	60	60	59	59	58	59	60	60	63	57	59	63	59	62	63	62	63	63	59
August																																
Maximum.....	64	65	64	65	66	66	64	63	65	65	64	64	65	64	63	64	64	64	64	63	64	62	63	62	62	60	58	60	59	58	57	63
Minimum.....	61	61	62	61	57	62	57	59	60	59	60	60	56	58	58	59	58	61	62	60	59	60	60	58	57	57	56	59	57	58	56	59
September																																
Maximum.....	56	58	57	60	61	60	62	61	59	57	56	58	57	57	56	58	58	56	55	54	50	52	54	56	55	55	57	58	58	57	-	57
Minimum.....	55	55	54	56	59	59	59	59	57	57	55	56	54	54	53	54	56	55	54	48	50	50	52	55	55	55	55	53	57	57	-	55
October																																
Maximum.....	58	57	56	56	50	49	50	46	49	50	50	52	53	53	53	50	50	50	50	48	49	50	46	45	46	47	48	46	48	49	48	50
Minimum.....	57	55	55	50	49	48	45	44	46	49	49	48	50	50	50	48	48	49	46	47	49	46	43	44	44	47	47	46	47	48	45	48
November																																
Maximum.....	47	41	40	40	40	40	42	42	40	41	42	43	42	42	42	40	40	39	37	37	37	34	33	37	39	40	38	36	34	34	-	39
Minimum.....	42	40	38	39	36	36	39	39	37	39	42	41	41	40	41	31	38	35	36	35	36	32	33	34	37	38	35	35	33	33	-	37
December																																
Maximum.....	34	36	38	37	37	38	37	39	40	39	36	37	38	36	36	40	41	41	40	38	39	39	39	34	34	35	35	35	36	36	35	37
Minimum.....	34	35	36	35	35	36	37	37	39	36	35	35	36	36	35	38	41	38	36	36	37	38	33	33	34	34	34	34	36	35	33	36

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1958

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	34	34	34	34	35	35	36	36	36	36	36	36	36	36	36	39	38	37	36	34	36	35	34	34	35	36	36	36	37	39	38	36
Minimum.....	33	34	34	34	34	34	35	35	36	35	36	36	36	35	35	36	35	36	34	34	34	33	34	34	35	35	34	35	35	38	37	35
February																																
Maximum.....	38	39	38	40	40	36	37	35	34	36	38	36	36	35	36	40	41	41	45	45	45	46	45	45	44	43	40	40	-	-	-	40
Minimum.....	36	38	37	40	39	35	34	34	33	34	35	34	35	34	34	37	38	34	44	44	45	45	45	44	43	41	37	39	-	-	-	38
March																																
Maximum.....	40	40	40	40	41	41	42	43	42	40	40	40	38	39	38	38	39	41	45	44	45	45	48	48	48	47	47	48	47	47	47	43
Minimum.....	39	40	40	40	40	38	40	41	40	40	38	39	36	37	37	37	36	37	41	44	43	43	45	48	47	46	46	46	46	46	46	41
April																																
Maximum.....	48	48	47	47	47	47	47	48	48	50	51	51	54	52	51	51	52	52	51	52	50	50	45	46	48	48	47	47	48	52	-	49
Minimum.....	46	48	46	46	46	46	46	47	47	47	49	50	52	51	51	50	50	51	51	51	49	44	44	45	45	37	46	46	47	50	-	47
May																																
Maximum.....	53	56	57	58	58	57	56	54	56	54	55	53	49	52	54	54	54	54	54	53	53	52	50	50	51	52	50	52	53	53	53	54
Minimum.....	51	50	55	56	56	56	56	53	54	54	53	49	44	49	52	50	54	53	53	53	51	49	50	49	49	50	49	50	50	51	52	52
June																																
Maximum.....	53	52	52	50	52	54	54	56	56	53	52	53	53	52	54	56	57	57	57	57	57	57	58	60	56	58	60	61	60	58	-	56
Minimum.....	52	52	52	49	49	53	54	55	53	52	52	53	51	52	53	54	54	54	57	53	56	56	58	56	56	56	56	60	58	56	-	54
July																																
Maximum.....	58	58	59	58	59	60	58	58	60	61	62	63	62	62	61	62	62	62	62	62	64	64	60	63	65	65	62	63	64	63	65	62
Minimum.....	56	54	56	57	57	57	57	56	59	60	61	61	61	59	60	61	60	61	60	59	62	64	58	62	64	63	60	52	60	62	60	59
August																																
Maximum.....	65	65	64	64	65	65	66	67	66	62	67	65	67	67	68	67	66	64	65	65	65	62	63	63	64	64	64	64	63	57	60	64
Minimum.....	64	61	60	63	60	64	66	66	62	62	65	62	65	66	65	66	63	63	63	65	64	60	61	62	63	63	63	63	58	55	55	63
September																																
Maximum.....	61	60	58	56	59	60	60	61	62	60	60	61	57	55	54	54	54	54	55	54	54	54	54	52	50	50	52	53	53	51	-	56
Minimum.....	60	58	56	53	58	60	60	61	60	60	55	56	55	53	53	53	53	53	54	53	54	52	52	49	47	46	48	50	50	50	-	54
October																																
Maximum.....	50	50	52	53	54	54	54	53	51	50	50	52	53	54	53	52	52	52	52	51	47	48	49	48	46	49	46	46	45	46	47	50
Minimum.....	50	49	50	52	53	54	53	51	48	49	48	48	52	53	50	50	51	51	52	45	45	47	48	46	46	48	45	45	43	44	43	49
November																																
Maximum.....	46	45	44	45	44	44	44	44	44	46	46	43	42	42	40	35	34	36	34	40	40	43	43	43	40	36	34	34	34	42	-	41
Minimum.....	43	43	43	43	43	44	44	43	43	45	45	42	40	40	36	33	33	34	34	36	40	42	42	43	35	34	34	33	34	34	-	39
December																																
Maximum.....	42	39	40	40	34	34	34	33	33	35	37	38	38	38	36	37	38	38	40	40	40	41	40	38	38	37	37	38	38	36	38	38
Minimum.....	37	39	40	37	33	34	34	33	33	34	36	37	37	34	34	34	37	38	39	39	40	40	40	36	37	37	37	37	36	36	35	36

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1959

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	38	33	33	33	34	34	34	35	35	37	37	39	40	38	36	35	37	37	38	36	33	33	34	37	38	38	37	38	39	38	38	36
Minimum.....	36	33	33	33	33	34	34	34	34	36	37	38	38	36	34	35	37	37	37	33	33	33	33	37	37	36	36	37	37	38	36	35
February																																
Maximum.....	37	36	37	34	33	34	36	34	34	35	36	37	36	35	36	37	34	35	37	36	36	37	37	37	38	38	38	38	-	-	-	36
Minimum.....	36	33	34	33	33	31	33	34	34	34	35	36	35	34	35	35	33	33	35	36	36	37	35	37	37	37	37	37	-	-	-	35
March																																
Maximum.....	40	40	41	40	41	40	42	42	39	41	40	41	41	42	42	43	45	45	45	43	44	44	45	45	46	47	47	46	45	45	44	43
Minimum.....	39	38	40	39	39	40	40	40	39	40	40	41	41	40	40	42	44	45	43	42	43	44	43	45	46	47	46	45	44	44	43	42
April																																
Maximum.....	45	48	48	49	49	51	49	47	43	44	45	47	50	51	51	50	45	45	44	45	49	51	49	48	44	46	48	49	49	51	-	48
Minimum.....	44	48	46	47	47	50	46	42	43	43	45	46	49	50	48	49	43	45	41	42	46	49	48	44	43	43	47	49	48	49	-	46
May																																
Maximum.....	52	51	49	50	49	49	51	54	55	50	49	51	53	53	52	53	53	50	48	50	50	50	50	50	51	51	52	51	49	48	50	50	51
Minimum.....	51	50	48	47	47	49	50	53	52	47	46	49	50	52	52	53	51	47	46	44	48	48	48	51	51	50	50	49	47	49	47	49
June																																
Maximum.....	54	55	56	54	54	53	52	50	50	50	49	51	51	51	51	59	51	53	54	53	53	53	55	55	55	55	54	54	54	52	-	53
Minimum.....	51	53	53	53	49	51	50	49	49	49	47	47	48	50	50	49	50	52	52	51	53	52	53	53	53	54	54	54	50	50	-	51
July																																
Maximum.....	55	55	56	55	56	58	58	55	57	59	60	--	62	60	62	63	64	64	65	64	65	65	65	65	65	65	66	65	63	63	63	61
Minimum.....	52	54	54	55	51	53	54	53	53	54	55	--	58	57	58	58	62	58	59	63	60	60	58	61	60	61	61	60	58	58	63	57
August																																
Maximum.....	66	65	64	65	64	64	65	65	64	64	63	62	62	58	60	61	63	62	61	60	62	62	61	62	62	60	59	60	60	60	60	62
Minimum.....	63	63	58	63	64	64	64	64	64	64	58	62	56	56	56	60	57	56	60	60	58	59	60	54	61	58	55	55	56	55	55	59
September																																
Maximum.....	58	56	58	58	57	55	60	60	57	57	58	58	59	59	58	56	55	54	44	54	53	53	52	53	54	52	52	52	51	50	-	55
Minimum.....	55	54	55	58	55	55	55	57	57	57	53	54	56	56	56	54	53	53	43	53	52	52	51	51	52	52	50	50	48	48	-	53
October																																
Maximum.....	50	50	50	50	50	50	50	50	50	47	49	50	50	50	49	50	50	50	50	50	50	50	50	50	50	50	48	48	49	47	48	50
Minimum.....	48	49	48	49	50	50	50	36	48	46	48	48	48	48	48	48	50	50	50	48	48	49	49	49	49	50	47	48	47	46	46	48
November																																
Maximum.....	47	47	48	49	48	47	48	47	45	47	47	47	46	48	42	47	42	42	42	44	42	46	44	45	44	43	46	44	42	44	-	45
Minimum.....	45	46	46	49	44	45	45	34	45	45	45	46	44	40	38	41	41	40	42	42	42	42	40	44	42	42	42	40	40	42	-	43
December																																
Maximum.....	44	43	44	44	46	47	44	44	44	41	43	43	43	44	45	44	45	44	44	44	42	45	46	42	42	43	43	42	42	40	40	43
Minimum.....	41	42	43	43	43	44	43	41	41	40	40	42	42	42	42	44	42	42	42	42	42	42	42	41	42	42	40	40	39	32	38	41

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1960

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	41	42	43	44	35	34	34	35	35	35	36	36	37	36	34	35	33	33	33	33	33	33	33	35	36	36	37	37	39	39	39	36
Minimum.....	38	41	42	40	34	33	33	34	35	35	36	36	35	33	33	33	33	33	33	33	33	33	33	34	35	35	36	37	36	38	38	35
February																																
Maximum.....	39	38	38	38	37	38	38	40	40	40	40	40	38	36	36	36	38	38	34	35	36	36	35	33	33	34	34	33	34	-	-	37
Minimum.....	38	38	38	35	35	36	38	37	37	40	40	40	37	36	36	35	36	34	34	34	36	35	33	33	33	33	33	33	33	-	-	36
March																																
Maximum.....	33	33	33	33	34	34	36	38	38	36	37	37	38	40	40	40	41	44	44	47	48	49	49	49	49	50	50	49	46	45	44	41
Minimum.....	33	33	33	33	33	34	34	36	36	36	36	37	36	38	39	39	40	41	41	46	47	48	49	48	49	49	49	49	44	44	44	40
April																																
Maximum.....	44	44	49	50	52	53	53	52	53	53	48	46	46	47	45	43	43	44	48	49	47	47	47	43	43	44	44	44	47	48	-	47
Minimum.....	44	43	45	49	51	52	52	51	53	53	46	46	46	46	43	41	42	43	47	47	46	46	44	42	42	44	42	43	42	46	-	46
May																																
Maximum.....	50	51	50	50	50	53	53	53	53	55	55	55	53	53	50	50	49	46	46	50	51	50	51	49	50	51	53	52	53	54	55	51
Minimum.....	50	50	50	48	49	50	53	52	51	54	54	53	49	46	48	48	46	46	46	46	48	48	49	49	49	49	50	51	53	54	52	50
June																																
Maximum.....	52	53	53	52	52	53	52	51	51	52	53	53	55	54	53	53	54	53	54	54	53	53	55	57	59	59	59	60	59	59	-	54
Minimum.....	52	52	52	51	51	52	51	51	51	51	52	52	53	53	51	51	53	53	54	53	51	50	51	56	57	57	55	56	54	58	-	53
July																																
Maximum.....	60	60	61	61	61	61	63	63	63	60	62	64	64	64	64	64	65	67	67	65	66	67	66	66	65	64	63	65	66	65	64	64
Minimum.....	59	60	59	60	60	61	62	63	60	57	60	62	59	61	60	58	60	60	61	63	64	65	65	64	64	63	59	61	60	61	63	61
August																																
Maximum.....	67	66	66	65	65	65	65	63	62	65	65	66	65	65	64	61	58	58	62	64	64	64	60	60	54	56	63	61	57	60	59	62
Minimum.....	61	65	65	64	64	64	63	59	58	58	59	59	61	60	63	58	58	56	60	63	62	60	60	53	53	53	54	54	57	57	58	59
September																																
Maximum.....	58	60	60	61	62	60	59	59	55	55	57	59	58	58	59	60	55	55	57	56	56	52	53	51	55	56	56	56	56	54	-	57
Minimum.....	56	56	60	60	59	59	58	55	52	55	55	58	55	55	58	55	55	53	56	56	56	52	52	51	51	55	55	56	54	54	-	55
October																																
Maximum.....	54	54	54	54	54	54	54	54	52	47	48	48	47	47	47	47	48	48	49	48	48	49	50	50	49	49	49	48	45	44	42	49
Minimum.....	54	54	53	54	53	53	53	53	46	46	47	47	46	45	45	46	47	46	47	46	46	48	47	48	48	48	49	45	43	41	41	48
November																																
Maximum.....	43	43	44	42	42	42	42	41	39	42	41	41	42	42	41	40	40	41	41	40	39	41	39	40	43	44	40	36	34	36	-	41
Minimum.....	43	41	42	41	40	40	42	40	38	38	38	39	41	41	40	40	40	41	41	38	38	36	36	38	41	42	36	35	33	34	-	39
December																																
Maximum.....	37	39	40	39	37	35	35	34	35	34	34	34	35	36	35	33	35	37	37	36	36	38	41	38	38	38	36	35	34	34	33	36
Minimum.....	37	38	40	37	35	33	33	34	33	33	34	33	35	36	34	33	33	36	37	35	36	36	37	37	38	36	35	35	34	33	33	35

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1961

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	34	34	34	34	34	38	35	37	38	38	37	37	36	37	38	39	38	38	38	38	34	34	35	35	34	33	33	33	33	35	35	36
Minimum.....	33	34	34	34	34	34	35	36	37	37	36	36	35	36	38	38	38	38	35	34	34	34	34	34	33	33	33	33	33	33	33	35
February																																
Maximum.....	37	37	37	37	38	41	41	42	42	42	42	44	42	40	40	42	41	40	40	38	42	42	42	41	40	39	39	36	-	-	-	40
Minimum.....	36	37	37	37	37	38	40	39	41	42	42	44	42	38	40	40	39	39	40	38	38	42	40	40	38	38	36	36	-	-	-	39
March																																
Maximum.....	36	39	39	39	37	37	39	40	40	40	41	40	42	44	46	48	48	48	45	48	43	46	48	48	50	47	47	45	45	46	46	43
Minimum.....	36	39	37	36	37	37	37	37	38	40	40	40	41	43	44	46	46	45	45	43	43	45	47	46	49	46	44	44	43	44	44	42
April																																
Maximum.....	47	50	52	52	48	47	47	46	45	46	41	40	42	44	46	48	48	48	45	48	43	46	48	48	50	47	47	45	45	46	-	47
Minimum.....	46	48	51	47	46	46	46	45	44	44	40	40	41	43	44	46	46	45	45	43	43	45	47	46	49	46	44	44	43	44	-	45
May																																
Maximum.....	56	56	54	54	52	48	47	51	57	57	53	53	53	54	--	--	--	--	50	50	54	56	56	56	55	53	53	52	51	50	--	53
Minimum.....	50	54	54	52	48	46	46	47	52	56	51	50	50	54	--	--	--	--	50	50	52	55	55	55	50	53	51	51	50	50	--	51
June																																
Maximum.....	53	53	50	50	51	54	53	54	52	53	53	53	54	53	56	56	58	59	58	59	60	60	60	60	62	62	61	60	60	62	-	56
Minimum.....	49	50	48	49	51	49	50	52	50	50	53	53	52	52	50	50	51	52	54	59	59	59	60	60	61	60	61	60	60	62	-	54
July																																
Maximum.....	62	62	63	63	64	64	63	65	65	65	62	62	63	65	65	65	66	66	64	63	63	65	65	65	67	65	64	64	64	64	64	64
Minimum.....	62	62	63	63	60	61	63	64	64	63	60	62	62	63	64	64	65	65	63	61	62	64	64	64	61	64	58	62	62	64	64	63
August																																
Maximum.....	64	65	65	66	66	66	64	62	60	59	58	60	62	62	64	64	64	61	62	65	64	65	65	65	65	65	63	63	63	61	60	63
Minimum.....	64	65	65	66	66	65	64	62	58	58	58	60	62	62	60	64	64	61	58	63	61	61	63	62	64	64	62	63	62	60	60	62
September																																
Maximum.....	58	57	57	57	58	59	58	54	53	53	53	53	53	53	51	51	51	60	58	56	57	50	50	49	48	49	50	50	50	50	-	54
Minimum.....	58	57	57	54	58	59	56	54	53	53	51	53	53	51	51	51	51	51	56	56	56	50	50	48	46	49	49	50	50	48	-	53
October																																
Maximum.....	48	48	50	52	51	52	50	48	49	46	48	46	48	48	50	50	52	50	50	50	48	48	46	46	46	42	46	46	44	40	40	48
Minimum.....	48	48	50	50	50	52	48	48	47	46	46	39	48	48	50	50	52	50	48	50	48	46	46	46	46	42	46	46	38	40	40	47
November																																
Maximum.....	40	44	40	42	40	40	40	40	42	42	44	42	44	42	42	40	38	38	38	38	40	37	38	42	42	42	40	42	42	42	-	41
Minimum.....	40	40	40	40	40	40	40	40	40	42	42	42	42	42	42	33	33	38	33	38	38	35	36	40	40	40	40	42	42	42	-	39
December																																
Maximum.....	42	42	42	42	42	40	38	36	36	36	40	36	36	36	36	33	36	38	36	34	36	34	34	36	36	36	36	36	36	34	34	37
Minimum.....	42	42	42	40	38	38	38	34	36	33	38	34	36	36	36	33	34	34	34	34	34	34	34	34	36	36	34	34	34	34	34	36

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1962

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	34	36	36	35	35	34	34	34	34	34	34	34	33	34	34	34	34	34	34	34	33	33	33	33	36	34	34	34	36	36	40	34
Minimum.....	34	36	36	34	34	34	34	34	34	34	34	34	33	34	33	34	33	34	34	34	33	33	33	33	33	34	34	34	34	35	36	34
February																																
Maximum.....	36	36	36	36	36	35	38	36	36	37	37	37	37	40	37	38	39	39	39	40	38	38	37	36	36	36	36	34	-	-	-	37
Minimum.....	36	36	36	36	35	34	36	36	36	37	37	37	36	37	36	37	34	38	38	37	36	37	34	36	34	34	34	34	-	-	-	36
March																																
Maximum.....	34	36	36	36	35	35	36	36	37	36	36	36	36	36	38	41	42	42	42	42	42	42	43	43	43	43	43	43	43	43	43	39
Minimum.....	34	36	36	36	35	34	35	36	36	36	36	36	36	36	38	38	42	41	42	42	42	42	43	43	43	43	43	43	43	43	43	39
April																																
Maximum.....	44	43	47	47	48	46	45	42	42	42	48	48	48	50	50	54	54	54	50	52	50	48	48	50	48	47	48	45	46	46	-	48
Minimum.....	43	43	46	44	47	45	44	40	42	42	42	45	45	48	48	52	54	50	50	49	48	47	48	48	48	46	44	44	45	44	-	46
May																																
Maximum.....	46	46	50	52	59	49	49	49	50	49	49	49	48	45	47	47	47	51	53	52	50	48	48	48	48	48	48	50	52	54	--	49
Minimum.....	45	46	46	50	49	47	47	47	48	49	46	47	45	44	44	46	46	46	51	50	49	48	48	48	48	46	46	48	40	52	--	47
June																																
Maximum.....	54	54	52	50	47	46	47	48	47	54	54	52	49	50	50	50	51	53	53	53	52	52	52	52	52	56	57	56	57	57	-	52
Minimum.....	54	51	51	50	45	45	47	48	47	47	51	48	48	49	50	50	50	51	52	52	52	52	52	52	52	53	54	53	52	54	-	50
July																																
Maximum.....	58	58	58	56	57	59	59	60	60	60	60	60	59	57	58	57	59	58	58	60	61	60	60	62	62	60	60	58	58	60	65	59
Minimum.....	56	56	56	55	55	57	58	58	60	56	56	56	57	55	57	56	56	56	56	56	56	60	60	62	58	58	58	56	56	58	63	57
August																																
Maximum.....	62	62	61	63	62	59	60	60	60	60	62	62	62	64	64	63	62	62	62	63	63	62	58	60	60	60	58	56	56	54	54	61
Minimum.....	58	60	60	62	62	59	60	60	59	60	57	58	60	62	64	62	62	62	62	62	62	62	56	55	56	56	56	55	55	54	53	59
September																																
Maximum.....	58	58	57	56	58	59	58	56	50	52	52	52	52	54	56	56	57	58	57	57	57	55	56	56	56	56	56	56	54	53	-	56
Minimum.....	56	57	55	52	52	56	57	50	50	52	52	52	52	52	54	56	57	57	57	56	54	55	55	54	53	52	52	54	52	52	-	54
October																																
Maximum.....	54	54	53	54	54	54	54	54	52	51	50	50	50	52	52	50	50	50	50	50	50	50	50	50	49	47	48	49	49	48	49	51
Minimum.....	53	52	52	53	54	54	54	52	49	51	50	50	50	52	50	49	50	48	49	50	50	50	49	49	46	44	46	48	45	48	47	50
November																																
Maximum.....	49	48	48	48	48	46	46	42	42	43	49	46	46	46	46	44	43	40	40	40	40	41	38	37	39	41	40	40	40	40	-	43
Minimum.....	48	47	47	48	48	46	41	42	42	42	42	42	42	44	44	42	40	40	40	40	40	40	37	37	39	40	40	40	40	37	-	42
December																																
Maximum.....	40	39	40	40	40	40	42	42	42	40	38	40	40	39	40	41	41	41	41	42	42	42	35	35	35	35	36	36	36	36	36	39
Minimum.....	38	39	40	40	40	40	40	40	40	38	38	38	39	37	40	40	41	41	41	40	42	34	34	34	34	33	36	36	34	34	36	38

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1963

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	36	37	37	37	36	36	36	36	36	34	34	34	34	34	34	34	34	34	34	34	44	40	34	33	33	34	33	33	33	33	34	35
Minimum.....	36	36	37	37	36	35	35	35	36	34	34	33	33	34	33	33	34	34	34	34	33	33	34	33	33	33	33	33	33	33	34	34
February																																
Maximum.....	36	35	35	37	37	37	37	37	38	38	34	35	36	37	36	37	37	37	37	37	37	39	39	40	40	42	42	41	-	-	-	37
Minimum.....	36	35	35	36	36	37	36	35	35	37	33	34	35	35	35	36	37	37	37	37	36	37	39	39	40	41	41	40	-	-	-	37
March																																
Maximum.....	40	40	40	40	39	36	39	39	40	41	40	40	40	40	42	41	42	45	44	42	44	44	45	44	45	47	46	44	46	46	46	42
Minimum.....	40	40	40	37	39	36	37	38	38	38	39	40	38	39	40	41	42	42	42	42	42	43	40	42	42	45	45	43	44	46	46	41
April																																
Maximum.....	46	45	42	40	40	47	46	46	45	44	46	46	51	50	52	50	48	48	46	44	44	44	44	41	42	52	52	50	50	55	-	47
Minimum.....	45	41	40	40	40	45	45	45	45	43	45	46	46	46	50	45	45	44	43	44	40	43	40	40	42	52	52	46	48	52	-	45
May																																
Maximum.....	53	53	50	50	52	54	51	47	48	47	47	46	48	50	51	52	54	53	53	53	48	50	46	50	49	47	48	49	50	50	50	50
Minimum.....	53	49	49	45	50	52	50	47	47	47	43	46	46	48	48	51	50	53	51	51	46	46	46	47	47	46	47	46	50	50	50	48
June																																
Maximum.....	50	48	49	48	48	49	46	46	46	48	46	50	52	52	50	50	50	50	50	52	52	48	51	51	51	51	57	58	57	54	-	50
Minimum.....	50	48	48	48	46	46	46	46	44	48	46	49	50	50	50	50	50	50	50	50	51	42	50	50	49	49	52	54	52	53	-	49
July																																
Maximum.....	55	60	60	60	60	58	59	59	60	59	60	60	60	61	59	58	60	60	60	60	62	60	64	64	64	63	61	62	62	63	62	60
Minimum.....	54	53	53	58	56	56	55	56	59	58	60	59	60	59	58	56	60	60	58	58	60	60	62	62	63	63	60	60	61	62	61	59
August																																
Maximum.....	62	62	62	62	64	64	63	66	64	64	64	65	65	64	64	64	64	64	63	63	62	60	58	60	61	62	62	62	62	60	60	63
Minimum.....	62	62	62	60	62	61	62	61	60	64	60	62	62	64	64	64	64	64	59	59	58	57	56	59	60	61	60	61	60	60	58	61
September																																
Maximum.....	58	58	58	58	61	61	60	62	62	62	61	58	58	58	56	56	56	56	55	55	58	58	56	58	58	58	58	58	58	58	-	58
Minimum.....	58	58	56	56	56	58	58	58	58	61	60	57	57	55	55	56	56	54	55	55	58	55	55	56	56	57	57	58	58	58	-	57
October																																
Maximum.....	58	58	58	56	56	56	54	54	56	54	54	55	55	54	58	54	54	55	52	52	52	52	52	50	50	50	50	48	48	48	48	53
Minimum.....	58	58	55	53	55	54	53	53	53	54	53	54	54	54	55	54	54	50	50	50	50	50	50	48	50	50	46	46	46	48	48	52
November																																
Maximum.....	48	42	44	46	46	46	47	47	47	46	46	46	44	46	46	46	46	42	40	40	37	39	40	40	40	42	42	40	40	39	-	43
Minimum.....	47	41	42	44	45	45	45	45	45	45	46	46	44	46	46	46	42	40	40	40	35	39	38	38	38	42	40	40	39	39	-	42
December																																
Maximum.....	39	39	36	35	35	38	40	38	38	36	36	35	35	35	35	35	35	34	35	35	36	35	36	35	35	38	36	37	36	36	36	36
Minimum.....	39	35	34	34	35	35	38	38	34	34	34	34	35	34	35	35	34	34	35	35	35	34	36	35	34	36	35	36	36	35	35	35

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1964

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	35	36	37	36	36	36	36	35	34	34	34	35	35	35	35	35	35	35	35	35	35	35	35	35	34	36	36	36	35	37	37	35
Minimum.....	35	35	36	36	35	36	35	34	34	34	34	34	35	35	35	34	35	35	35	35	35	34	34	34	34	34	35	35	35	35	35	35
February																																
Maximum.....	36	36	36	33	36	35	35	35	35	36	38	37	37	35	36	34	34	35	36	35	36	36	38	38	34	33	34	34	34	-	-	35
Minimum.....	35	36	33	33	35	34	34	33	35	35	37	37	34	35	34	34	34	34	35	33	33	35	36	35	33	33	33	34	34	-	-	34
March																																
Maximum.....	36	37	38	36	38	38	39	38	38	36	38	38	38	38	36	40	44	44	42	42	42	41	36	33	33	34	35	36	38	34	38	38
Minimum.....	34	35	34	34	37	37	38	38	35	36	37	37	38	36	36	38	42	42	41	38	41	36	33	33	33	33	34	36	34	34	34	36
April																																
Maximum.....	39	38	42	42	48	48	43	46	46	46	46	46	45	48	52	--	42	44	--	--	--	48	--	--	44	--	43	43	53	--	-	45
Minimum.....	36	36	42	42	43	43	39	43	46	46	46	44	45	45	46	--	42	44	--	--	--	44	--	--	43	--	43	43	53	--	-	43
May																																
Maximum.....	54	--	--	--	50	46	48	48	48	53	53	50	55	55	56	53	51	51	50	51	51	50	50	49	49	48	50	48	48	47	49	50
Minimum.....	52	--	--	--	44	44	46	48	48	53	52	48	50	54	52	51	49	47	46	51	50	49	49	49	48	48	47	48	48	45	46	49
June																																
Maximum.....	50	48	50	50	50	50	49	48	48	48	48	48	48	50	50	50	48	48	48	48	49	48	54	55	55	55	55	54	54	54	-	50
Minimum.....	48	48	47	50	50	49	49	48	48	48	47	47	48	49	50	50	48	48	48	48	48	48	48	54	55	55	55	54	52	53	-	50
July																																
Maximum.....	55	56	56	57	57	58	59	58	60	60	59	62	62	62	62	62	62	62	62	64	64	64	64	63	63	64	65	64	65	64	64	61
Minimum.....	52	53	53	56	54	56	57	58	59	59	59	59	62	57	57	57	58	59	62	62	61	61	60	63	63	64	65	64	64	63	63	59
August																																
Maximum.....	64	64	64	64	64	64	64	64	63	64	63	61	61	63	63	59	59	63	63	58	57	60	60	60	58	58	56	54	54	54	53	61
Minimum.....	63	64	63	64	63	60	63	62	63	63	62	60	59	62	59	59	59	59	59	57	56	58	60	59	58	58	56	54	52	53	53	59
September																																
Maximum.....	53	55	53	55	56	58	56	57	57	57	54	56	56	57	57	57	58	57	56	53	52	52	53	53	53	53	53	52	52	52	-	55
Minimum.....	53	53	53	53	55	56	56	56	57	55	54	54	53	54	54	54	57	56	56	52	52	52	52	53	53	53	48	49	52	51	-	54
October																																
Maximum.....	52	52	50	52	52	52	52	52	52	52	52	52	52	52	52	50	50	50	50	48	49	57	59	48	48	48	47	47	47	48	-	51
Minimum.....	52	50	50	52	50	52	51	52	52	52	52	49	50	50	50	50	50	48	47	47	49	48	48	48	48	47	46	47	46	47	-	49
November																																
Maximum.....	48	48	48	47	47	47	48	46	46	46	46	46	42	42	40	40	39	38	42	41	40	40	40	40	40	40	39	36	36	40	-	43
Minimum.....	46	48	46	46	46	46	45	46	46	46	45	44	42	38	35	36	36	38	40	40	38	40	40	40	40	39	36	36	36	36	-	41
December																																
Maximum.....	40	40	41	41	42	40	36	36	37	37	39	39	38	36	36	35	36	35	36	35	35	35	37	37	37	37	38	39	37	35	35	37
Minimum.....	36	38	40	40	40	36	34	34	36	36	38	35	35	36	35	33	33	33	34	35	35	35	37	37	37	36	37	37	36	35	35	36

157. Yellowstone River at Livingston Water Works, at Livingston, Mont.
Water temperatures (°F), calendar year 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	35	36	36	36	36	38	40	36	38	34	36	35	37	36	37	38	39	39	36	37	38	38	38	37	37	37	37	38	38	38	38	37
Minimum.....	35	36	34	35	36	37	38	35	35	34	34	34	36	36	36	37	38	37	35	36	37	38	38	37	36	35	35	38	38	38	38	36
February																																
Maximum.....	39	38	36	36	39	40	40	39	38	37	38	38	33	36	36	36	36	37	40	42	37	40	40	34	36	37	40	40	-	-	-	38
Minimum.....	38	36	35	35	39	40	39	36	38	37	37	37	33	35	36	34	35	37	38	39	35	37	40	33	36	36	40	40	-	-	-	37
March																																
Maximum.....	40	40	35	37	37	37	41	42	41	39	39	38	40	40	40	40	36	35	34	35	35	35	34	34	34	34	34	33	33	42	--	37
Minimum.....	38	38	35	36	37	37	40	41	40	37	38	38	38	38	40	36	35	35	34	34	35	35	34	34	33	34	33	33	32	36	--	35
April																																
Maximum.....	45	48	34	42	48	--	46	46	45	--	36	36	36	40	41	40	40	42	47	47	47	--	--	47	46	45	50	--	--	--	-	43
Minimum.....	42	37	34	34	37	--	--	--	44	--	34	34	35	38	40	38	38	42	47	46	46	--	--	--	--	--	--	--	--	--	-	--
May																																
Maximum.....	45	--	--	45	47	47	47	43	--	47	47	55	47	55	55	46	48	47	50	50	46	46	46	47	50	47	45	49	50	50	50	48
Minimum.....	45	--	--	--	45	--	--	--	--	47	47	47	47	47	55	46	45	47	47	46	45	45	45	44	45	46	--	45	50	50	47	47
June																																
Maximum.....	50	50	50	50	50	51	50	50	50	50	51	50	50	50	50	49	49	49	50	51	51	51	51	51	50	50	50	50	50	50	-	50
Minimum.....	50	50	50	50	50	49	49	49	49	50	50	50	50	50	50	49	49	49	48	50	51	51	51	50	50	50	50	50	50	50	-	50
July																																
Maximum.....	50	50	51	53	53	53	53	55	52	53	55	55	55	55	59	59	60	60	60	60	60	60	60	60	60	60	61	61	63	62	64	57
Minimum.....	50	50	50	51	53	53	53	53	52	53	55	55	55	55	55	59	60	58	60	60	58	58	60	60	59	56	57	57	60	62	62	56
August																																
Maximum.....	62	64	64	64	62	60	63	64	63	62	65	65	65	64	64	62	63	63	60	60	59	60	58	56	56	56	56	56	56	56	56	61
Minimum.....	62	63	64	60	62	59	60	58	59	62	60	65	64	63	62	62	62	60	60	59	58	58	58	56	56	56	56	56	56	56	56	60
September																																
Maximum.....	56	56	53	53	54	53	54	54	54	54	54	53	53	53	53	53	45	50	50	48	48	50	52	49	50	50	--	--	--	--	-	52
Minimum.....	56	53	53	52	54	50	50	50	54	52	53	53	53	53	47	47	45	45	47	47	47	49	51	47	48	48	--	--	--	--	-	50
October																																
Maximum.....	--	50	50	--	--	--	--	53	53	53	--	--	--	--	--	--	--	48	--	--	--	--	--	50	50	50	50	50	50	50	50	--
Minimum.....	--	50	50	--	--	--	--	52	53	53	--	--	--	--	--	--	--	48	--	--	--	--	--	50	50	--	--	47	--	--	--	--	--
November																																
Maximum.....	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	44	50	50	50	50	48	47	45	--	--	44	42	42	42	--	-	48
Minimum.....	45	45	50	50	50	50	45	50	50	50	50	50	50	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
December																																
Maximum.....	43	39	45	46	46	46	45	46	46	42	40	40	38	34	35	36	35	38	33	33	34	33	34	34	34	35	34	35	36	35	34	38
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

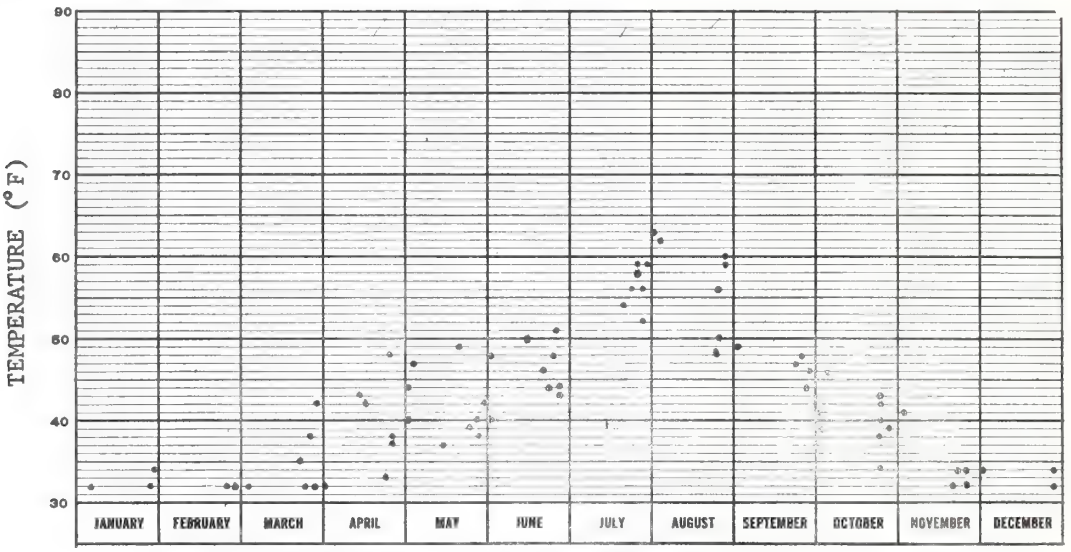
158. Shields River near Wilsall, Mont. (6-1930)

Location.--At gaging station, lat 46°09', long 110°35', in SE¼NW¼ sec.34, T.5 N., R.9 E., on left bank 11 miles northeast of Wilsall and 12 miles upstream from Flathead Creek. Altitude of gage is 5,590 ft (by barometer).

Drainage area.--87.8 sq mi.

Water temperature records available.--75 spot observations made at time of discharge measurements during period July 1949 to September 1957.

Extremes.--Discharge 1935-57: Maximum, 1,770 cfs June 4 or 5, 1948; minimum not determined.
Water temperatures 1949-57: Maximum observed, 63°F Aug. 1, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-57

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-52	1025	32	29-52	1100	32	2-50	1230	32	27-50	0900	33	16-50	1000	37	1-50	1500	40
29-52	1700	32	25-53	1100	32	28-51	1130	32	18-52	1405	43	30-51	0900	38	24-50	1000	44
30-53	1345	34	25-54	1030	32	27-52	1200	35	19-52	1345	42	2-52	1440	47	28-51	0900	43
						30-53	1400	42	28-52	1720	48	24-52	1545	49	26-52	1135	48
						29-56	1430	38	28-54	1330	38	28-52	0930	40	15-53	1630	50
						29-57	0930	38	1-55	1500	32	1-53	1430	44	28-54	1330	44
									28-55	1300	37	27-54	1200	39	2-55	1430	40
												1-56	1630	40	27-55	1630	51
												2-57	1500	47	1-56	1300	48
												31-57	0830	42	21-57	1300	46
July			August			September			October			November			December		
25-49	1600	58	26-49	1400	55	27-49	1130	48	2-50	1340	39	2-49	1600	41	30-52	1200	32
23-50	1330	54	2-51	1545	62	25-51	1015	47	24-50	1400	43	29-50	1345	34	1-53	1600	34
29-52	0955	52	27-51	0850	48	30-52	0920	46	28-51	1030	34	27-51	1100	32	30-55	1730	34
29-54	1500	56	28-52	0900	50	2-53	1200	49	28-52	1105	38	29-52	1120	32			
28-55	1600	59	1-53	1600	63	29-53	0930	44	28-53	1300	42	28-56	1300	34			
25-56	1300	56	30-54	1700	59				1-54	1200	41						
31-57	1000	59	30-55	1400	60				28-54	1530	40						
									4-55	1600	46						
									29-56	1600	39						

159. Shields River at Clyde Park, Mont. (6-1935)

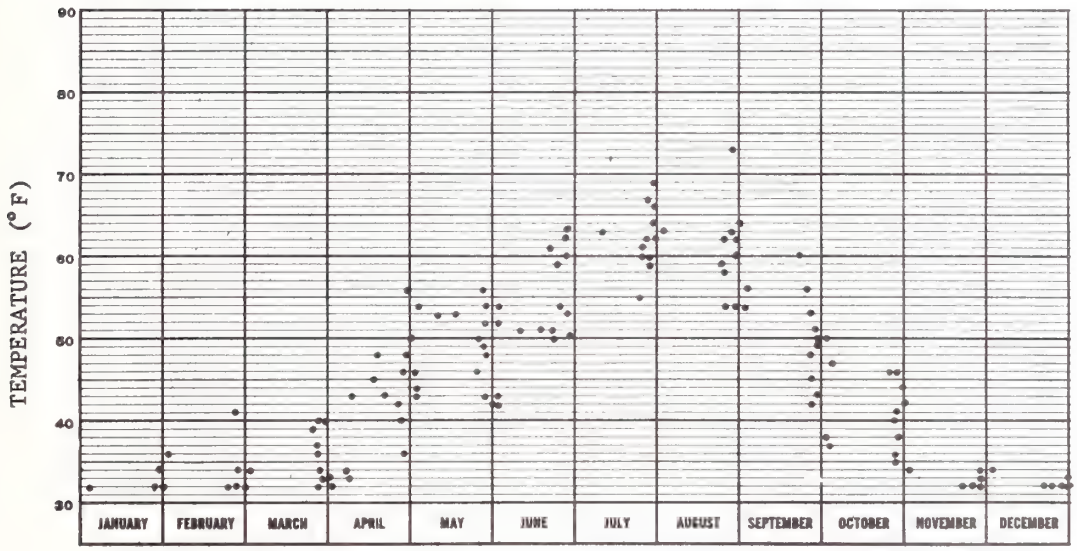
Location.--At gaging station, lat 45°53'10", long 110°37'05", in NW¼NW¼ sec.33, T.2 N., R.9 E., on right bank just downstream from highway bridge, three-quarters of a mile west of Clyde Park, 2 miles upstream from Brackett Creek, and at mile 14.2. Altitude of gage is 4,780 ft (from topographic map).

Drainage area.--543 sq mi.

Water temperature records available.--158 spot observations made at time of discharge measurements during period July 1949 to December 1965.

Extremes.--Discharge 1921-23, 1929-32, 1934-65: Maximum, 4,500 cfs June 5, 1958; minimum observed, 1.8 cfs Aug. 29, 1935.

Water temperatures 1949-65: Maximum observed, 73°F Aug. 29, 1956; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

159. Shields River at Clyde Park, Mont. (6-1935)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-52	1420	32	1-52	1000	32	28-51	1430	33	10-50	1400	43	16-50	1520	53	1-50	1020	42
30-53	1100	34	29-52	1600	32	27-52	1600	36	27-50	1230	40	2-52	1030	46	23-50	1540	50
26-55	1100	32	25-53	1430	34	30-53	1130	40	7-52	1610	34	25-52	0845	50	28-51	1130	53
4-62	1510	32	24-54	1300	41	29-56	1230	34	8-52	0935	33	1-53	1600	44	26-52	1635	54
30-63	1425	32	1-61	1155	36	29-57	1530	40	18-52	1600	48	27-53	1030	49	2-55	1100	43
28-64	1150	32	1-62	1655	32	24-59	1000	39	19-52	0915	43	27-54	0930	43	27-55	1330	60
27-65	1130	32	27-62	1005	32	28-60	1620	37	28-54	1000	36	1-56	1400	43	21-57	1800	51
			26-63	1025	34	1-61	1300	34	1-55	1200	32	2-57	1300	54	27-58	1230	63
			23-65	1430	32	28-61	1510	36	30-58	1500	50	31-57	1230	42	24-59	1630	59
						28-63	0920	40	27-60	1440	42	28-59	1830	48	2-60	1215	54
						24-64	1100	32	26-61	1235	42	25-61	0950	49	27-60	1630	62
						31-65	1110	33	27-62	1040	42	29-62	1530	52	28-61	1150	62
									30-63	0815	48	28-63	1500	56	19-62	1650	61
									29-64	1200	56	29-64	0730	54	27-62	1200	60
									15-65	1505	45	11-65	1715	53	1-63	1525	52
									28-65	1800	46	26-65	1400	46	26-63	1050	54
															3-64	1630	54
															10-65	1205	51
															16-65	0745	51
															29-65	1040	50
July			August			September			October			November			December		
25-49	1130	61	26-49	1130	58	27-49	0800	45	2-50	1140	37	29-50	1635	33	30-52	1530	32
23-50	0955	55	27-51	1540	54	3-50	1100	56	24-50	1650	46	27-51	1330	34	1-53	1330	34
30-51	1515	64	27-52	1430	62	25-51	1330	48	28-51	1400	36	29-52	1500	32	30-55	1200	33
29-52	1515	66	1-53	1230	63	2-53	0830	54	28-52	1405	40	28-56	0930	32	31-57	1130	32
29-54	1100	62	30-54	1330	62	29-53	1300	51	1-54	0900	38	29-57	1700	32	30-58	1600	32
28-55	1100	60	30-55	1030	60	25-56	1230	53	28-54	1230	40	29-58	1700	32	23-59	1100	32
25-56	0900	60	29-56	1300	73	29-58	1530	49	4-55	1200	47	2-60	0810	34	29-60	1130	32
31-57	1300	62	31-60	1240	64	21-59	1130	60	29-56	1300	35	28-60	1555	32	28-62	1030	32
29-58	0830	60	30-61	1125	62	29-60	1010	50	1-57	0900	50	29-61	1030	32	30-63	0920	32
27-60	1125	62	29-62	1455	54	28-61	0940	42	31-57	1600	42	29-62	1100	32	27-65	1230	32
27-61	1100	67	28-63	1300	63	26-63	1320	56	30-58	1530	46	26-63	1335	33			
11-63	1500	63	25-64	1550	59	29-64	0805	43	29-59	1300	40	23-64	0935	32			
30-63	1545	69	24-65	1515	59	27-65	1310	42	31-62	1400	44	29-65	1200	32			
29-65	0820	59							30-63	1310	38						
									27-64	1245	41						

160. Brackett Creek near Clyde Park, Mont. (6-1940)

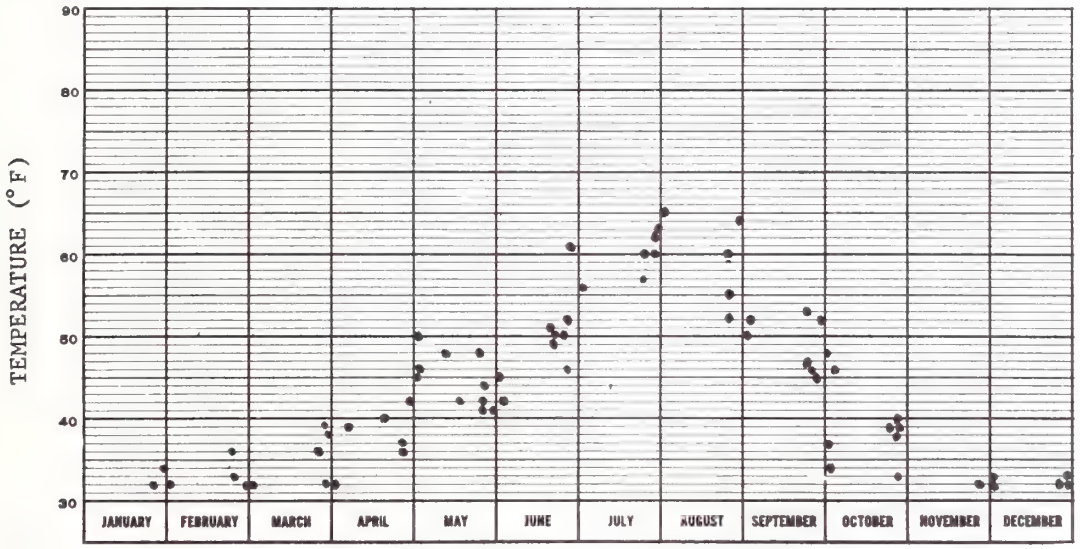
Location.--At gaging station, lat 45°52'00", long 110°40'10", in SE¼NE¼ sec.1, T.1 N., R.8 E., near right bank on upstream side of private bridge, 3½ miles southwest of Clyde Park and 4 miles upstream from mouth. Altitude of gage is 4,930 ft (from topographic map).

Drainage area.--57.9 sq mi.

Water temperature records available.--74 spot observations made at time of discharge measurements during period May 1949 to October 1957.

Extremes.--Discharge 1921-23, 1934-57: Maximum, 1,400 cfs May 22, 1948, minimum daily, 0.5 cfs Dec. 23, 24, 1952.

Water temperatures 1949-57: Maximum observed, 65°F Aug. 1, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-57

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-53	1045	34	1-52	1400	32	2-50	1000	32	27-50	1100	37	13-49	1200	48	1-50	1200	45
26-55	1200	32	29-52	1630	32	27-52	1715	36	8-52	1210	39	16-50	1220	42	23-50	1600	50
			25-53	1400	33	30-53	1000	38	19-52	1150	40	2-52	1230	46	28-51	1300	52
			24-54	1500	36	29-56	1100	32	30-53	1830	42	25-52	1135	48	26-52	1430	50
						29-57	1100	39	28-54	1130	36	27-53	0900	41	28-54	1130	46
									1-55	1300	32	28-53	1400	42	2-55	1200	42
									28-55	1100	36	27-54	1030	44	27-55	1500	61
												1-56	1500	45	19-56	1230	51
												2-57	1630	50	21-57	1500	49
												31-57	1030	41			
July			August			September			October			November			December		
25-49	1300	57	26-49	1230	55	27-49	0900	46	2-50	1030	34	27-51	1530	32	1-50	0900	32
30-51	1810	63	27-51	1335	52	3-50	1030	52	25-50	0855	39	29-52	1600	32	30-52	1400	32
29-52	1335	62	27-52	1635	60	25-51	1540	47	28-51	1530	38	28-56	1100	32	1-53	1430	33
1-53	1300	56	1-53	1400	65	30-52	1350	52	28-52	1515	39				30-55	1500	33
29-54	1300	62	30-55	1200	64	2-53	0930	50	1-54	1000	37				27-56	1000	32
28-55	1300	60				29-53	1130	45	28-54	1330	40						
25-56	1030	60				25-56	1100	53	4-55	1300	46						
31-57	1130	60							29-56	1430	33						
									1-57	1000	48						

161. Boulder River near Contact, Mont. (6-1975)

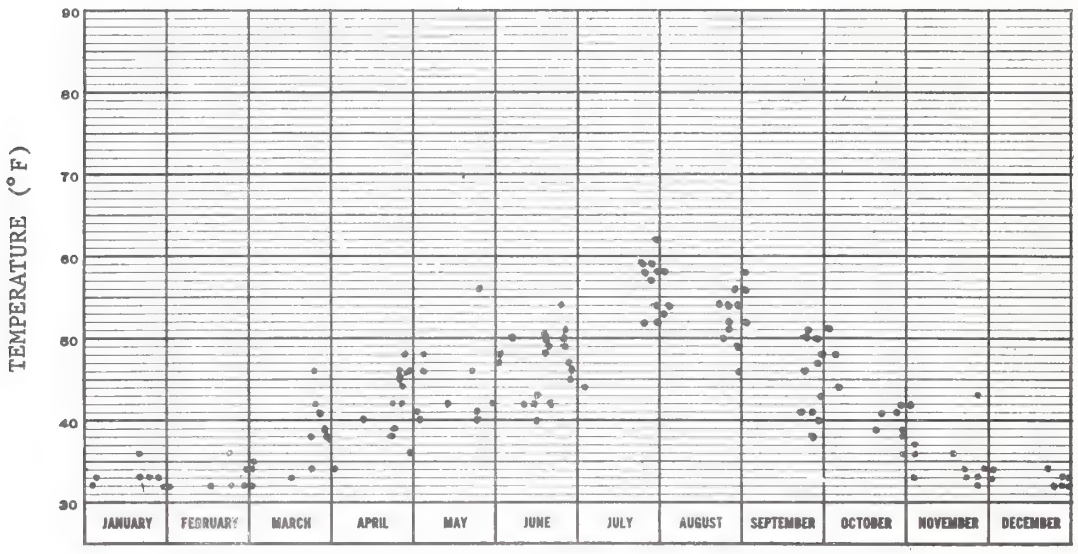
Location.--At gaging station, lat 45°33'20", long 110°12'00", in SE¼SE¼ sec.23, T.3 S., R.12 E., on left bank half a mile downstream from Boulder Falls, 3 miles north of Contact, 6 miles upstream from East Fork, 22 miles southwest of Big Timber, and at mile 28.8. Altitude of gage is 4,930 ft (from topographic map).

Drainage area.--226 sq mi.

Water temperature records available.--155 spot observations made at time of discharge measurements during period March 1951 to December 1965.

Extremes.--Discharge 1910-16, 1929, 1950-65: Maximum observed, 5,100 cfs June 14, 1911; minimum, 4.2 cfs Feb. 27, 1961.

Water temperatures 1951-65: Maximum observed, 62°F July 29, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-65

161. Boulder River near Contact, Mont. (6-1975)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-52	1200	32	28-52	1200	34	26-51	1445	42	28-53	1200	44	3-51	1530	48	12-52	0930	42
31-52	1000	32	24-53	1300	32	29-52	1010	39	30-54	0930	36	1-52	0930	41	28-52	1550	51
21-53	1200	36	24-54	0930	36	24-53	1200	38	27-55	1230	46	26-52	1200	41	29-54	1500	46
5-55	1230	33	1-61	1520	32	17-55	0800	33	29-58	1700	48	26-54	1300	40	7-55	1630	50
25-55	1530	33	2-62	0915	32	2-56	1300	35	28-59	1300	42	2-56	1100	40	29-55	1030	45
28-59	1130	33	28-63	1400	34	30-56	1030	38	26-60	1430	39	3-57	1230	46	1-56	1800	47
5-62	0925	32	27-64	1830	32	27-57	1300	41	25-61	1420	42	29-57	0915	40	18-56	1800	50
29-63	1430	32	17-65	1430	32	27-58	1000	39	25-62	1220	38	27-59	1230	41	20-57	1400	49
30-64	1015	32				31-60	0930	39	30-63	1415	46	24-61	1505	46	26-58	1330	54
20-65	1600	33				1-61	1540	34	28-64	1630	45	30-62	1245	42	17-59	1500	48
						27-61	1445	39	1-65	1000	34	26-64	1730	56	2-60	1555	48
						1-62	1020	32	13-65	1400	40	13-65	1140	43	23-60	1055	42
						27-63	1325	46							27-61	1125	50
						26-64	1430	34							15-62	1200	40
															26-62	1655	51
															15-63	1435	43
															25-63	1535	49
															14-65	1555	42
															28-65	1730	47
July			August			September			October			November			December		
31-52	0930	52	1-51	1300	58	27-51	1015	41	30-51	1100	38	29-51	1000	34	2-53	0930	34
2-53	1200	44	29-51	1130	49	1-53	1200	56	3-52	1000	48	24-52	1530	33	31-55	1130	33
29-53	1730	62	27-52	0900	51	30-53	1600	48	29-52	1025	42	3-54	1530	37	26-56	1600	32
30-55	1600	58	3-54	1230	54	29-54	1600	40	27-53	1600	41	2-55	1600	33	31-57	1400	32
29-57	1400	58	27-54	1100	52	1-55	1400	58	5-55	1230	44	27-56	1430	33	30-58	1100	32
28-58	1430	59	27-56	1330	54	24-56	0950	50	30-56	1530	36	28-57	1400	33	21-59	1500	34
29-59	1200	54	29-61	1000	56	30-58	1200	43	1-57	1500	51	28-58	1500	32	1-60	1125	33
26-60	1410	58	1-62	1215	53	22-59	1330	46	30-57	1200	42	27-59	1300	32	28-60	1450	32
25-61	0945	59	30-62	1235	46	1-60	1025	52	29-58	1200	38	3-60	1100	36	27-62	1155	32
31-63	1305	54	29-63	1030	54	28-60	1440	50	29-59	0900	39	1-61	0945	36	30-63	1230	32
28-64	1330	57	25-64	1235	50	27-61	0945	38	31-63	1135	36	28-61	1000	43	28-64	1110	33
26-65	1215	52	23-65	1420	54	25-62	1210	51	23-64	1400	41	1-62	1305	42	23-65	1210	32
						25-63	1450	50	18-65	1500	39	28-62	1310	34			
						29-64	1245	47				25-63	1520	33			
						20-65	1145	41				22-64	1415	34			
												17-65	0940	36			

162. Boulder River at Big Timber, Mont. (6-2000)

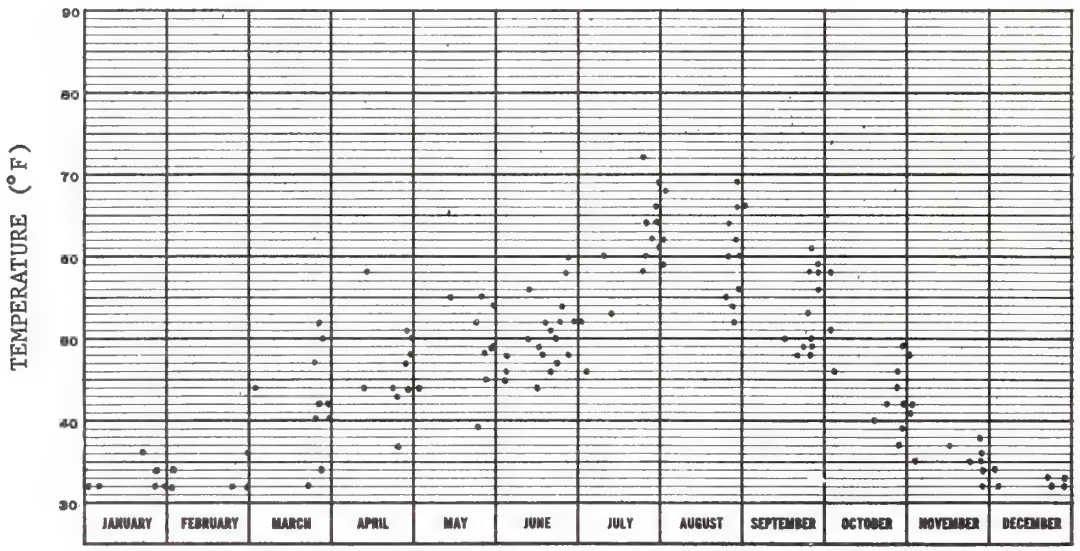
Location.--At gaging station, lat 45°50'05", long 109°56'20", in NE¼SE¼ sec.14, T.1 N., R.14 E., on left bank 1 mile east of Big Timber and 2 miles upstream from mouth. Altitude of gage is 4,060 ft (from topographic map).

Drainage area.--523 sq mi.

Water temperature records available.--145 spot observations made at time of discharge measurements during period August 1949 to December 1953, March 1955 to December 1965.

Extremes.--Discharge 1947-53, 1955-65: Maximum, 9,840 cfs May 28, 1956; minimum, 10 cfs about Aug. 26 or 27, 1961.

Water temperatures 1949-53, 1955-65: Maximum observed, 72°F July 25, 1961; minimum freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1955-65

162. Boulder River at Big Timber, Mont. (6-2000)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
21-53	1400	36	28-52	1630	32	28-52	1600	50	13-50	1430	58	24-50	1300	39	14-50	1130	44
1-58	1200	32	24-53	1530	32	24-53	1430	47	29-52	1730	44	28-51	1230	45	12-52	1250	50
31-58	1730	32	2-61	1145	34	30-55	1530	42	28-53	1500	47	27-52	1400	48	3-55	1400	46
28-59	1630	34	2-62	1510	32	27-56	1700	34	29-55	1830	51	2-56	1400	44	29-55	1330	52
5-62	1600	32	28-63	1615	36	27-57	1100	42	30-58	1400	50	29-57	1300	49	20-56	1600	51
27-64	1600	32	27-64	1700	32	26-58	1600	40	29-59	1730	48	27-59	1500	45	22-57	1100	47
20-65	1355	36				31-60	1130	40	26-60	1130	43	25-61	1725	52	27-58	1630	58
						2-61	1150	44	26-61	0935	37	30-62	1555	54	17-59	1230	48
						28-61	1210	42	25-62	1705	44	26-64	1400	55	3-60	1300	48
						27-63	1540	52	13-65	1220	44	13-65	1330	55	23-60	1225	50
						23-64	1700	32							27-61	1725	60
						31-65	1640	40							15-62	1730	49
															20-62	0925	46
															26-62	1320	52
															2-63	1015	45
															15-63	1715	48
															18-63	1715	52
															25-63	1815	54
															13-64	1000	56
															15-65	1305	44
															16-65	1100	48
															28-65	1340	48
July			August			September			October			November			December		
13-50	1200	53	27-49	0900	54	26-49	1000	50	29-51	1730	37	28-51	1630	38	4-50	1400	32
1-52	1700	52	1-51	0900	59	15-50	1430	50	2-52	1600	58	3-55	0900	35	2-53	1200	34
30-52	1625	66	28-51	1600	52	26-51	1550	49	29-52	1725	46	27-56	1630	35	29-55	1200	33
2-53	1630	46	26-52	1440	64	1-53	1430	66	28-53	1000	44	28-57	1630	34	30-58	1330	33
26-56	0700	58	2-55	1500	68	28-53	1700	59	4-55	1830	46	28-58	1700	32	21-59	1300	33
31-57	1630	61	31-55	1800	60	24-56	1600	53	30-56	1330	39	27-59	1500	32	28-60	1600	32
28-58	1030	62	27-56	1100	54	22-59	1530	49	2-57	1130	51	2-60	1610	42	27-62	1430	32
30-59	1730	64	29-57	1700	62	28-60	1700	58	30-57	1400	49	28-60	1520	32	27-63	1530	32
26-60	2005	64	31-60	1435	62	27-61	1545	48	29-58	1500	44	1-61	1510	41	23-64	1545	32
25-61	1700	72	29-61	1700	66	25-62	1600	58	31-63	1330	42	28-61	1605	38	22-65	1530	33
10-63	1715	60	1-62	1455	62	25-63	1600	61	23-64	0955	42	1-62	1640	48			
31-63	1600	69	30-62	1455	56	29-64	1535	56	18-65	1705	40	28-62	1600	36			
26-65	1500	60	28-63	1540	69	20-65	1500	48				25-63	1410	35			
			24-64	1710	60							22-64	1200	35			
			24-65	1240	55							16-65	1535	37			

163. Sweet Grass Creek above Melville, Mont. (6-2005)

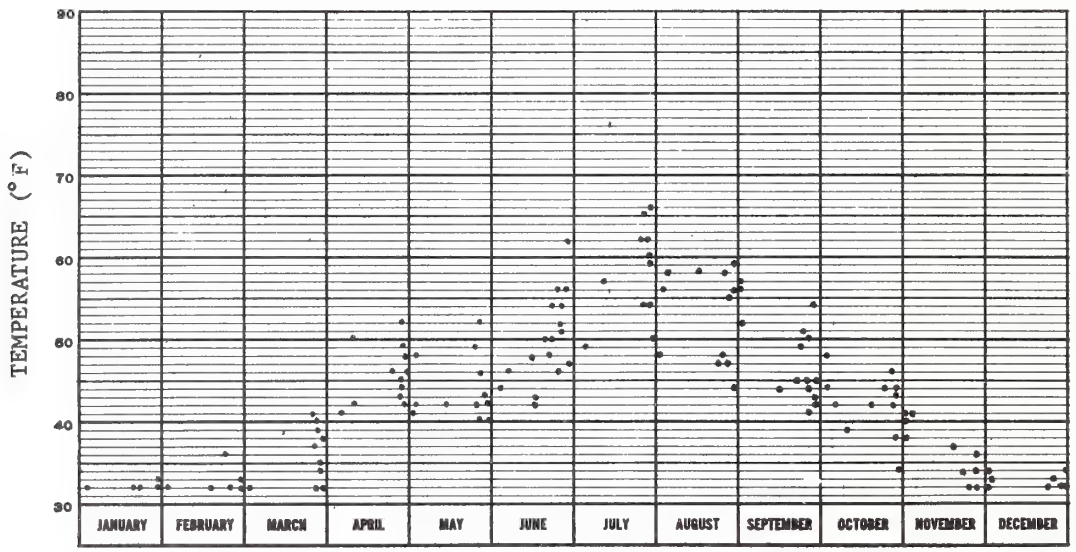
Location.--At gaging station, lat 46°09', long 110°05', in NW¼ sec.27, T.5 N., R.13 E., on right bank 7½ miles northwest of Melville. Altitude of gage is 5,490 ft (by barometer).

Drainage area.--63.8 sq mi.

Water temperature records available.--151 spot observations made at time of discharge measurements during period July 1949 to December 1965.

Extremes.--Discharge 1913-24, 1937-65: Maximum, 2,270 cfs June 17, 1965; minimum, 0.7 cfs Mar. 22, 1957.

Water temperatures 1949-65: Maximum observed, 66°F July 28, 1964; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

163. Sweet Grass Creek above Melville, Mont. (6-2005)
Water temperatures at time of discharge measurements

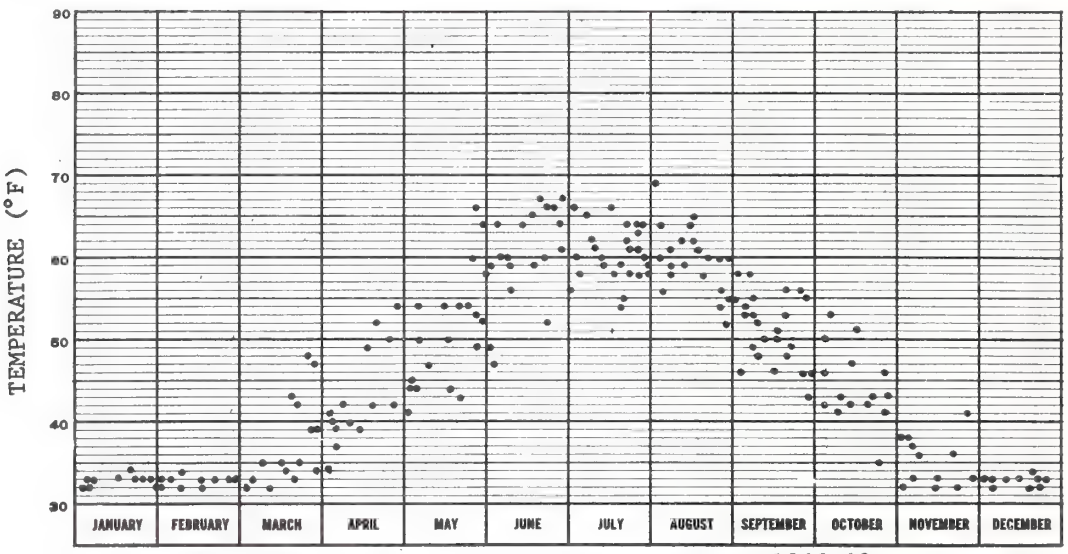
Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-52	1100	32	27-51	1820	32	28-52	1040	35	12-50	1500	50	24-50	1900	42	14-50	1600	48
30-52	1140	33	27-52	1130	33	24-53	1635	41	5-51	1130	41	3-51	1000	42	27-51	1330	54
22-53	0830	32	25-53	0930	32	30-54	1430	32	29-52	0930	42	27-52	1000	43	27-52	1450	51
5-62	1230	32	23-54	1730	36	30-56	1330	38	28-53	1730	45	26-54	0930	40	29-54	1100	47
29-63	1010	32	2-61	1000	32	27-57	1630	39	27-55	1600	43	2-56	1600	41	7-55	1100	46
30-64	1500	32	2-62	1220	32	27-58	1300	40	30-58	1800	48	3-57	0900	48	23-55	1600	54
20-65	1125	32	27-64	1430	32	31-60	1305	38	28-59	1600	44	31-57	1630	40	20-57	1730	48
			17-65	1155	32	2-61	0915	32	29-60	1400	49	27-59	1730	46	26-58	1700	52
						28-61	0950	34	28-61	1505	52	25-61	1320	49	24-59	1230	56
						1-63	0950	32	25-62	0900	46	30-62	0920	42	3-60	1000	44
						27-63	0930	37	30-63	1100	46	28-63	0900	42	22-60	1510	50
						26-64	1130	32	28-64	1130	45	26-64	1000	52	27-61	1425	56
						31-65	1405	32	13-65	1625	42	13-65	0840	42	15-62	0915	42
															20-62	1230	50
															26-62	0950	51
															15-63	0925	43
															25-63	1000	46
															28-65	1635	62
July			August			September			October			November			December		
26-49	1330	65	25-49	1200	58	15-50	1100	44	10-49	1800	39	1-50	1100	38	1-53	1600	34
30-52	0910	50	6-51	1900	58	26-51	0935	41	29-51	1030	38	28-51	1000	34	2-54	1200	33
3-53	1100	49	28-51	1000	47	1-53	1630	57	2-52	0945	44	3-54	1230	41	31-55	1600	34
28-54	1200	54	26-52	0930	48	28-53	1300	54	29-52	1505	44	28-58	1200	32	31-57	1700	32
29-57	1700	59	14-53	1600	58	29-54	1230	42	27-53	1230	46	27-59	0930	32	26-58	1500	33
28-58	1700	62	27-54	1400	55	1-55	1100	56	5-55	0900	42	2-60	1335	38	22-59	1500	32
29-59	1530	60	2-55	1130	56	24-56	1800	51	30-56	1000	34	1-61	1240	40	1-60	1500	32
26-60	1720	62	29-61	1250	59	30-58	0900	45	2-57	0900	48	28-61	1415	36	29-60	0910	32
26-61	0940	54	1-62	0925	48	22-59	1030	49	29-58	1700	43	1-62	0930	41	27-62	0910	32
10-63	1400	57	30-62	0900	44	1-60	1400	52	28-59	1700	42	28-62	0930	32	30-63	1540	32
31-63	1015	50	29-63	1320	56	29-60	1000	43	31-63	0940	34	25-63	0945	32	23-64	1400	32
28-64	1030	66	25-64	1000	47	27-61	1230	44	23-64	1620	44	22-64	1645	34	23-65	0910	32
29-65	1040	59	24-65	0935	47	25-63	0900	45	18-65	1135	42	17-65	1230	37			
						27-64	1715	50									
						20-65	1225	45									

164. Butcher Creek near Luther, Mont.

Location.--Lat 45°17'25", long 109°28'40", in NE¼SW¼ sec.23, T.6 S., R.18 E., at bridge on county road just below confluence of East and West Forks of Butcher Creek, 2½ miles west of Luther. Altitude of gage is 5,230 ft (from topographic map).

Water temperature records available.--221 spot observations made at time of discharge measurements and water quality sampling during period May 1960 to September 1962 published in reports of the Geological Survey and republished in this report.

Extremes.--Water temperatures 1960-62: Maximum observed, 69°F Aug. 1, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1960-62

Water temperatures at time of discharge measurements and water quality sampling

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-61	1000	32	3-61	0915	33	2-61	1320	32	3-61	0905	41	5-60	1600	44	1-60	0630	49
6-61	1445	33	6-61	1420	33	6-61	1400	33	7-61	1030	39	9-60	1010	47	6-60	1530	60
10-61	1045	33	10-61	1335	32	10-61	1030	35	10-61	1310	42	13-60	1415	54	10-60	1350	59
14-61	1330	33	14-61	1520	33	14-61	1030	35	14-61	1110	38	16-60	1815	44	13-60	1230	64
17-61	1145	34	16-61	1240	33	17-61	1400	43	17-61	1100	42	21-60	1235	54	16-60	1410	59
20-61	1440	33	20-61	1010	33	20-61	1315	42	21-61	1350	52	24-60	1155	54	20-60	1415	60
23-61	1325	33	24-61	1245	33	24-61	1315	48	25-61	1015	42	27-60	0930	52	24-60	1430	66
26-61	1440	33	27-61	0940	33	27-61	0900	47	28-61	1430	54	31-60	1505	58	27-60	1415	61
31-61	1145	32	1-62	1220	32	30-61	1445	38	2-62	1020	34	2-61	--	41	2-61	1230	59
3-62	0700	32	6-62	1245	33	5-62	1205	33	4-62	1400	40	4-61	1305	45	5-61	1245	64
5-62	1050	32	9-62	1215	34	12-62	1220	32	5-62	1230	37	8-61	1100	50	9-61	1500	60
31-62	1200	33	15-62	0810	32	16-62	1215	34	11-62	1620	40	16-61	1400	44	12-61	1100	56
			21-62	1210	33	19-62	1105	33	16-62	1320	49	18-61	0930	43	16-61	1345	65
			27-62	1200	33	23-62	1150	35	19-62	1515	66	23-61	0910	54	19-61	1450	67
						26-62	1300	39	23-62	1110	50	24-61	1225	60	23-61	1500	66

164. Butcher Creek near Luther, Mont.

Water temperatures at time of discharge measurements and water quality sampling--Continued

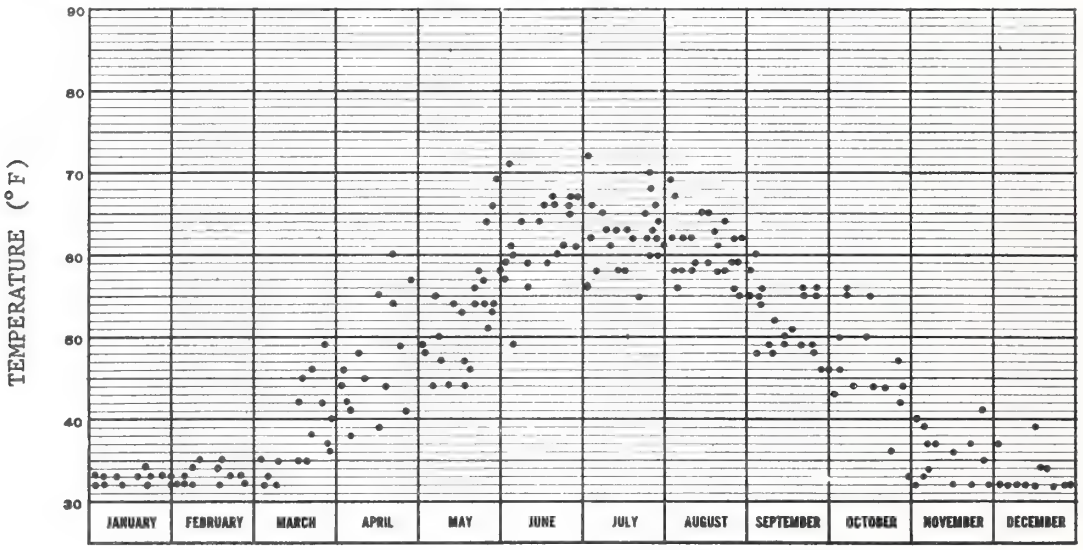
Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						30-62	1130	34				26-61	1315	66	26-61	1420	66
												29-61	1420	64	29-61	1340	67
												1-62	1130	44	4-62	1150	47
												7-62	1215	54	18-62	1145	59
												16-62	1020	47	22-62	1230	52
												16-62	1625	52	25-62	1245	64
												21-62	1330	54			
												25-62	1040	49			
												28-62	1200	52			
July			August			September			October			November			December		
1-60	0900	56	1-60	1250	69	1-60	1330	55	4-60	0750	46	1-60	1020	38	2-60	0920	32
6-60	1030	58	5-60	0845	56	6-60	0930	54	7-60	1300	53	4-60	1230	38	5-60	1450	32
8-60	1310	65	8-60	1500	58	9-60	0950	49	10-60	1005	43	7-60	1305	37	9-60	1355	32
11-60	1440	64	12-60	0920	59	12-60	0925	52	14-60	1200	42	10-60	1230	36	12-60	1210	32
15-60	1125	58	15-60	1400	65	16-60	1250	51	18-60	1230	42	15-60	1255	33	16-60	0950	32
19-60	0740	55	18-60	1045	58	19-60	1200	56	21-60	0940	43	21-60	0950	36	19-60	1230	32
22-60	1310	62	26-60	1240	56	23-60	1410	49	24-60	0910	46	25-60	1015	41	23-60	1535	32
29-60	1315	64	29-60	1110	55	26-60	1440	56	29-60	1110	43	29-60	1435	32	27-60	0950	32
5-61	1230	65	4-61	1310	64	30-60	0905	46	3-61	0835	42	2-61	1615	32	4-61	1330	32
11-61	1545	61	7-61	1400	61	1-61	1155	58	6-61	1220	50	6-61	--	33	5-61	1300	33
14-61	1310	67	11-61	1330	62	4-61	1405	58	9-61	1420	41	8-61	1335	33	18-61	1010	32
17-61	1050	59	14-61	1120	62	8-61	1200	53	13-61	1200	47	13-61	1220	32	20-61	1145	34
21-61	1400	64	21-61	1330	60	11-61	1315	50	16-61	1445	51	21-61	0835	32	22-61	1105	32
24-61	1400	63	25-61	1200	60	13-61	1120	46	20-61	1500	42						
28-61	1300	60	28-61	1710	60	18-61	1345	53	23-61	1215	35						
31-61	1110	58	3-62	1145	60	25-61	1345	46	27-61	1220	41						
2-62	1500	66	6-62	1125	59	29-61	1335	42									
3-62	1210	60	10-62	1140	59	4-62	1025	46									
9-62	1140	62	13-62	1230	64	5-62	1315	53									
10-62	1050	61	16-62	1240	61	7-62	1135	55									
12-62	1120	60	20-62	1130	60	10-62	1145	48									
13-62	0930	59	24-62	1150	54	14-62	1040	50									
17-62	0735	54	27-62	1450	56	18-62	0750	48									
20-62	1250	58	30-62	1820	52	24-62	1220	55									
23-62	1135	61															
24-62	1415	64															
25-62	1150	61															
27-62	1135	58															
30-62	1225	59															

165. Butcher Creek near Roscoe, Mont.

Location.--Lat 45°22'30", long 109°27'20", in NW¼NW¼ sec.25, T.5 S., R.18 E., at Peterson Place, 2½ miles northeast of Roscoe. Altitude of gage is 4,720 ft (from topographic map).

Water temperature records available.--249 spot observations made at time of discharge measurements and water quality sampling during period May 1960 to September 1962 published in reports of the Geological Survey and republished in this report.

Extremes.--Water temperatures 1960-62: Maximum observed, 72°F July 2, 1962; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1960-62

Water temperatures at time of discharge measurements and water quality sampling

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-61	1035	32	3-61	0945	33	2-61	1300	35	3-61	1005	46	5-60	1400	44	1-60	0745	52
6-61	1515	33	6-61	1445	33	6-61	1425	33	5-61	1045	38	9-60	1040	42	6-60	1545	67
10-61	1115	33	10-61	1355	40	10-61	1105	35	10-61	1335	45	13-60	1450	62	10-60	1420	58
14-61	1400	33	14-61	1545	34	14-61	1100	42	14-61	1145	39	16-60	1725	57	13-60	1300	64
17-61	1215	34	16-61	1310	35	17-61	1430	45	17-61	1130	44	21-60	1515	58	16-60	1330	61
20-61	1515	33	20-61	1045	33	20-61	1415	46	21-61	1415	54	24-60	1130	55	20-60	1445	62
23-61	1350	33	24-61	1300	33	24-61	1345	49	25-61	1040	41	27-60	0955	55	24-60	1525	67
26-61	1510	33	27-61	1015	33	27-61	0935	37	28-61	1520	57	31-60	1530	62	27-60	1455	63
31-61	1310	32	28-61	1040	32	30-61	1515	40	2-62	1200	44	2-61	0955	48	5-61	1335	71
3-62	0805	32	1-62	1140	32	5-62	1320	32	4-62	1240	42	2-61	1045	47	6-61	1140	61
3-62	1045	34	6-62	1220	33	12-62	1145	32	5-62	1205	42	4-61	1130	47	9-61	1540	64
4-62	1030	32	9-62	1150	34	16-62	1145	35	6-62	1620	41	4-61	1615	48	12-61	1035	56
5-62	1025	32	15-62	0835	32	19-62	1145	35	11-62	1645	48	8-61	1115	50	14-61	1245	58
12-62	1200	32	21-62	1140	33	23-62	1125	38	16-62	1350	55	12-61	1030	44	16-61	1415	66
18-62	1420	32	27-62	1130	33	26-62	1235	42	19-62	1540	60	16-61	1430	47	19-61	1525	67

165. Butcher Creek near Roscoe, Mont.

Water temperatures at time of discharge measurements and water quality sampling--Continued

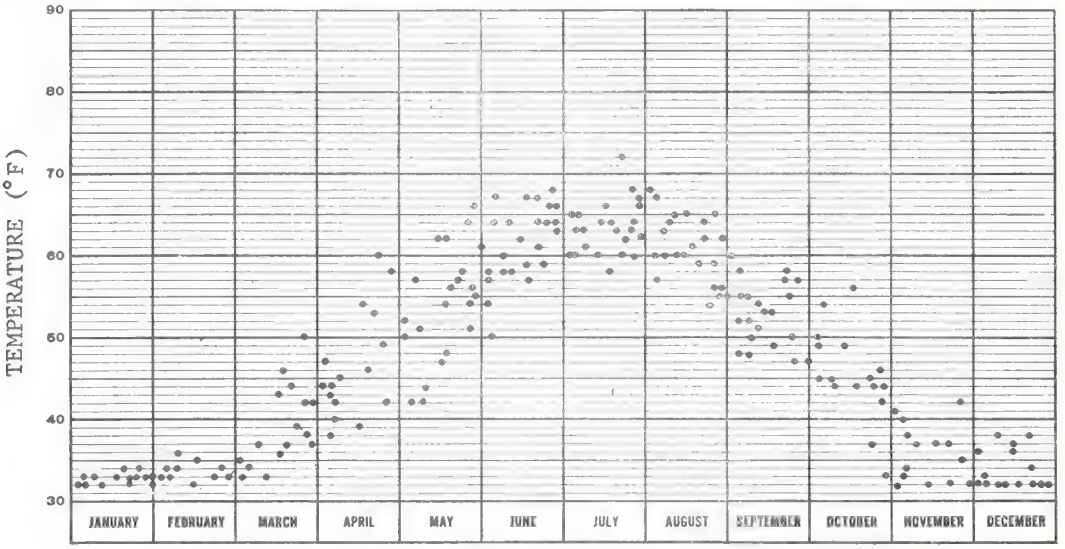
Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
26-62	1545	33				30-62	1050	36	23-62	1130	49	18-61	1010	46	23-61	1525	66
31-62	1130	33										19-61	1225	56	26-61	1350	65
												23-61	0930	57	29-61	1405	67
												24-61	1350	64	1-62	1435	57
												26-61	1350	70	4-62	1225	49
												26-61	1410	65	11-62	1430	59
												29-61	1450	69	18-62	1245	66
												1-62	1240	49	22-62	1150	61
												7-62	1150	55	25-62	1315	67
												16-62	1050	50			
												16-62	1655	56			
												21-62	1350	58			
												25-62	1110	51			
												28-62	1215	54			
July			August			September			October			November			December		
1-60	0925	57	1-60	1330	67	1-60	1310	54	4-60	0850	46	1-60	1130	40	2-60	0945	32
6-60	1200	61	5-60	0930	59	6-60	0950	55	7-60	1330	56	4-60	1300	39	5-60	1520	32
8-60	1335	67	8-60	1520	59	9-60	1020	50	10-60	1030	44	7-60	1325	37	9-60	1420	32
11-60	1515	64	12-60	0905	59	12-60	0950	53	14-60	1220	44	10-60	1300	37	12-60	1230	32
15-60	1155	62	15-60	1415	66	16-60	1315	51	18-60	1355	44	15-60	1320	36	16-60	1020	32
19-60	0830	59	18-60	1200	61	19-60	1235	57	21-60	1005	44	21-60	1015	37	19-60	1300	34
22-60	1530	70	26-60	1145	56	23-60	1430	50	24-60	0940	47	25-60	1045	41	23-60	1615	32
25-60	1340	64	29-60	1150	57	26-60	1445	57	29-60	1130	44	29-60	1445	32	27-60	1030	32
29-60	1335	66	4-61	1340	67	30-60	0925	47	3-61	0930	43	2-61	1505	32	1-61	1125	37
5-61	1345	66	7-61	1420	62	1-61	1225	58	6-61	1155	50	6-61	--	33	4-61	1200	33
11-61	1600	63	11-61	1400	62	4-61	1450	60	9-61	1440	55	8-61	1305	34	4-61	1400	32
14-61	1330	63	14-61	1100	59	8-61	1130	56	13-61	1135	50	13-61	1145	32	5-61	1200	33
17-61	1120	62	17-61	1115	63	11-61	1245	52	16-61	1525	55	21-61	0950	32	6-61	1755	32
21-61	1435	65	21-61	1400	64	13-61	1100	48	20-61	1530	44	27-61	1245	35	13-61	1040	32
24-61	1440	68	25-61	1235	62	18-61	1430	55	23-61	1145	36				14-61	1020	39
28-61	1330	66	28-61	1615	62	25-61	1320	48	27-61	1145	42				15-61	1100	32
31-61	1205	61	3-62	1125	62	29-61	1400	46	30-61	1300	33				18-61	1120	32
2-62	1435	72	6-62	1035	58	4-62	1055	48							19-61	1105	34
3-62	1140	62	10-62	1115	58	5-62	1210	55							20-61	1105	33
9-62	1115	63	13-62	1305	65	7-62	1110	54							21-61	1050	32
10-62	1030	61	16-62	1210	61	10-62	1120	48							22-61	1030	32
12-62	1050	62	20-62	1105	58	14-62	1015	50							29-61	1100	32
13-62	0910	58	24-62	1125	54	18-62	0840	49									
17-62	0820	55	27-62	1230	54	24-62	1200	55									
20-62	1225	60	30-62	1920	57												
23-62	1110	63															
24-62	1445	70															
25-62	1125	62															
27-62	1115	60															
30-62	1250	62															

166. Butcher Creek near Fishtail, Mont.

Location.--Lat 45°26'40", long 109°26'40", in SW¼NE¼ sec.36, T.4 S., R.18 E., 0.1 mile east of road junction, 3 miles east of Fishtail. Altitude of gage is 4,380 ft (from topographic map).

Water temperature records available.--250 spot observations made at time of discharge measurements and water quality sampling during period May 1960 to September 1962 published in reports of the Geological Survey and republished in this report.

Extremes.--Water temperatures 1960-62: Maximum observed, 72°F July 22, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1960-62

Water temperatures at time of discharge measurements and water quality sampling

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-61	1145	32	3-61	1000	33	2-61	1240	35	3-61	1020	47	5-60	1110	42	1-60	0855	54
6-61	1530	33	6-61	1500	34	6-61	1435	34	5-61	1030	38	9-60	1100	42	6-60	1605	64
10-61	1135	33	10-61	1420	36	10-61	1125	37	7-61	1115	40	13-60	1510	62	10-60	1445	58
14-61	1415	33	14-61	1600	35	14-61	1115	43	10-61	1345	45	16-60	1635	62	13-60	1330	62
17-61	1240	34	16-61	1400	35	17-61	1445	46	14-61	1210	39	24-60	1115	54	16-60	1215	57
20-61	1530	33	20-61	1100	33	20-61	1435	44	17-61	1150	46	27-60	1015	56	20-60	1505	61
23-61	1415	33	24-61	1330	34	24-61	1400	50	21-61	1430	53	31-60	1605	61	24-60	1550	66
26-61	1530	33	27-61	1030	33	27-61	0950	38	25-61	1050	42	2-61	1020	50	27-60	1515	63
31-61	1330	32	28-61	1055	33	30-61	1530	42	28-61	1625	58	2-61	1200	50	2-61	1120	58
3-62	0855	32	1-62	1120	32	5-62	1435	33	2-62	1310	44	4-61	1345	50	5-61	1350	67
3-62	1015	32	6-62	1200	33	12-62	1120	33	4-62	1215	43	4-61	1600	51	9-61	1545	64
4-62	1015	32	9-62	1135	34	16-62	1130	36	5-62	1145	44	8-61	1200	51	12-61	1020	58
5-62	1010	32	15-62	0900	32	19-62	1220	37	6-62	1500	42	12-61	1045	44	14-61	1310	59
12-62	1130	32	15-62	0930	32	23-62	1105	39	11-62	1655	45	16-61	1445	47	16-61	1430	67
18-62	1510	32	21-62	1120	33	26-62	1215	42	16-62	1410	54	18-61	1030	48	19-61	1550	67

166. Butcher Creek near Fishtail, Mont.

Water temperatures at time of discharge measurements and water quality sampling--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
26-62	1430	34	27-62	1115	33	30-62	1025	37	19-62	1555	60	19-61	1200	56	23-61	1540	64
31-62	1115	33							23-62	1150	49	23-61	0945	58	26-61	1335	64
												24-61	1435	64	29-61	1420	66
												29-61	1520	66	1-62	1450	57
												1-62	1250	52	4-62	1305	50
												7-62	1130	57	11-62	1500	60
												16-62	1110	50	18-62	1300	64
												16-62	1725	58	22-62	1130	59
												21-62	1415	57	25-62	1330	68
												25-62	1130	51			
												28-62	1230	55			
July			August			September			October			November			December		
1-60	0940	60	1-60	1345	68	1-60	1250	55	4-60	0945	49	1-60	1230	41	2-60	1000	32
6-60	1315	63	5-60	1025	60	6-60	1000	55	7-60	1345	54	4-60	1325	40	5-60	1540	32
8-60	1355	65	8-60	1535	60	9-60	1030	52	10-60	1045	44	7-60	0900	38	9-60	1440	32
15-60	1215	66	12-60	0850	60	12-60	1010	54	14-60	1240	44	10-60	1315	37	12-60	1245	32
19-60	0945	63	15-60	1435	65	16-60	1335	53	18-60	1540	45	15-60	1340	37	16-60	1045	32
22-60	1555	72	18-60	1310	62	19-60	1300	58	21-60	1020	44	21-60	1030	37	19-60	1440	32
25-60	1410	64	26-60	1130	58	23-60	1440	50	24-60	0955	46	25-60	1105	42	23-60	1630	32
29-60	1355	67	29-60	1205	56	26-60	1500	57	29-60	1145	44	29-60	1500	32	27-60	1045	32
5-61	1410	65	4-61	1400	67	30-60	0945	47	3-61	0945	45	2-61	1400	32	1-61	1045	36
11-61	1615	63	7-61	1440	63	1-61	1245	60	6-61	1140	50	6-61	1130	33	4-61	1130	32
14-61	1400	64	11-61	1415	64	4-61	1600	58	9-61	1500	45	8-61	1245	34	4-61	1415	32
17-61	1140	64	14-61	1030	60	8-61	1100	55	13-61	1120	49	13-61	1130	32	5-61	1145	33
21-61	1450	62	17-61	1245	61	11-61	1225	53	16-61	1540	56	21-61	1005	32	6-61	1740	32
24-61	1500	68	21-61	1420	64	13-61	1040	48	20-61	1545	45	27-61	1220	35	11-61	1010	38
28-61	1350	66	25-61	1300	65	18-61	1445	57	23-61	1130	37	30-61	1045	32	12-61	1100	32
31-61	1225	62	28-61	1545	62	25-61	1255	47	27-61	1130	42				13-61	1025	32
2-62	1345	65	3-62	1100	60	29-61	1420	47	30-61	1240	33				14-61	1000	36
3-62	1125	60	6-62	1015	57	4-62	1125	48							15-61	1040	37
9-62	1055	63	10-62	1050	60	5-62	1150	52							18-61	1215	32
10-62	1010	61	13-62	1325	65	7-62	1050	55							19-61	1045	38
12-62	1030	60	16-62	1125	60	10-62	1100	48							20-61	1045	34
13-62	0845	60	20-62	1045	59	14-62	0950	50							21-61	1030	32
17-62	0940	58	24-62	1100	54	18-62	0900	51							22-61	1010	32
20-62	1150	60	27-62	1215	56	24-62	1145	55							29-61	1045	32
23-62	1045	62	30-62	1935	55												
24-62	1505	63															
25-62	1105	62															
27-62	1050	60															
30-62	1340	62															

167 . Rosebud Creek near Absarokee, Mont. (6-2045)

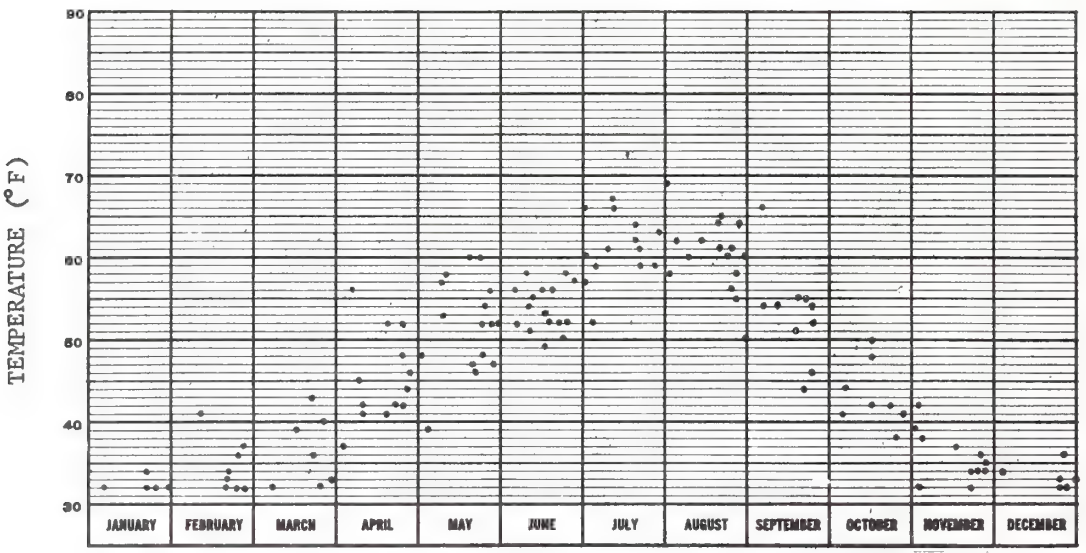
Location.--At gaging station, lat 45°29'10", long 109°27'20", in SW¼NW¼ sec.13, T.4 S., R.18 E., on right bank 80 ft downstream from Smith Bridge, 0.2 mile downstream from confluence of East and West Rosebud Creeks, and 2½ miles south of Absarokee. Altitude of gage is 4,160 ft (by barometer).

Drainage area.--394 sq mi.

Water temperature records available.--149 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1935-65: Maximum observed, 4,850 cfs June 22, 1937; minimum observed, 31 cfs May 25, Dec. 29, 1963.

Water temperatures 1949-65: Maximum observed, 69°F Aug. 1, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

167. Rosebud Creek near Absarokee, Mont. (6-2045)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
26-51	1330	32	20-51	1405	34	20-53	1500	43	18-49	1730	52	20-49	1300	46	22-49	0830	50
20-53	1430	34	18-53	1030	32	29-54	1500	33	10-50	1300	41	10-50	1700	53	13-50	1230	55
25-58	1230	32	23-54	1300	36	7-56	1200	32	10-52	1400	42	9-51	1600	57	6-51	1500	56
6-62	1030	32	11-61	1420	41	20-56	1200	36	17-53	1400	41	18-53	1600	60	18-51	1340	56
30-62	1230	32	26-62	1120	32	24-58	1330	40	26-55	1400	48	3-54	1400	39	10-52	1130	51
28-63	1340	32	25-63	1250	37	23-64	1300	32	26-56	1530	42	25-54	1400	54	15-53	1700	56
27-64	1230	32	24-64	1500	32	15-65	1345	39	23-57	1630	42	21-56	1530	60	15-54	1030	53
21-65	1315	32	18-65	1015	33				6-60	1600	56	29-56	1600	47	9-55	1530	58
									8-61	1730	45	24-57	1330	52	6-57	1300	52
									24-62	1210	52	19-59	1430	47	22-57	1700	52
									27-64	1200	44	28-60	1900	56	16-59	1800	56
									2-65	1205	37	10-61	1130	58	17-62	1050	52
									28-65	1020	46	31-62	1000	52	25-62	1220	58
												1-63	1515	48	14-63	1150	53
												28-63	1200	52	24-63	1310	52
												26-64	1300	54	11-65	1150	54
												24-65	1340	48	15-65	0900	49
															28-65	1605	57
July			August			September			October			November			December		
1-49	0900	66	27-49	1130	55	25-51	1430	52	16-50	1130	48	20-50	1730	32	28-50	1525	32
28-49	1130	59	9-50	1500	60	12-52	1100	54	25-51	1730	38	28-51	1530	35	3-54	1130	34
18-51	1800	64	27-51	1610	58	22-53	1200	55	14-52	1400	42	21-52	1400	34	27-55	1700	36
21-52	1200	61	21-52	1600	65	5-55	1500	66	22-53	1030	42	19-53	1300	32	24-57	1400	32
21-53	1200	59	28-53	1030	58	7-56	1200	54	4-54	1400	41	1-54	1400	39	23-58	1200	32
1-54	1500	60	24-54	1300	60	17-57	0930	51	6-55	1230	44	3-55	1400	38	31-59	1300	33
19-54	1600	63	4-55	1500	62	20-58	1200	55	15-56	1530	50	20-57	1530	32	26-62	1215	32
1-55	1400	57	20-57	1500	61	26-61	1245	46	16-57	1430	48	2-61	1230	32	27-63	1130	32
4-56	1100	52	18-58	1400	64	24-62	1235	54	15-60	1215	42	27-61	1355	34	23-64	0915	33
5-57	1400	59	13-60	1030	62	24-63	1210	54	28-63	1315	41	2-62	1010	42	22-65	1045	33
29-57	1000	59	1-61	1200	69	24-64	1215	52				27-62	1125	36			
13-60	1500	67	28-61	1105	64	21-65	1125	44				24-63	1125	34			
13-61	1530	66	2-62	1100	58							16-65	1025	37			
10-63	1310	61	31-62	0945	50												
29-65	1700	63	1-63	1035	58												
			30-63	1350	60												
			24-64	1400	56												
			25-65	1605	61												

168. Stillwater River near Absarokee, Mont. (6-2050)

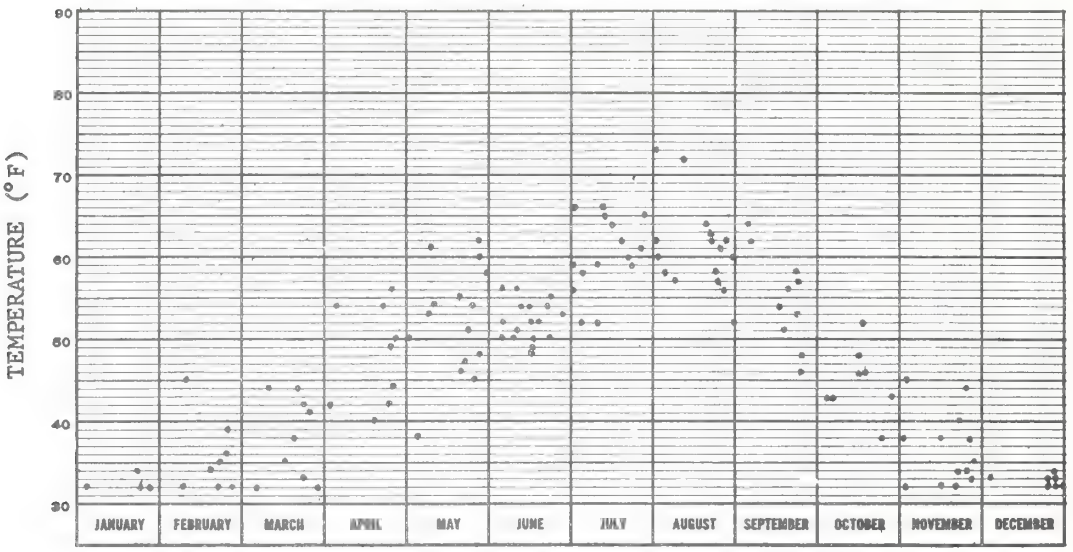
Location.--At gaging station, lat 45°33'04", long 109°23'12", in NE¼NW¼ sec.28, T.3 S., R.19 E., on right bank 3 miles downstream from Rosebud Creek, 3½ miles northeast of Absarokee, 9 miles southwest of Columbus, and at mile 10.8. Altitude of gage is 3,875 ft (from topographic map).

Drainage area.--975 sq mi.

Water temperature records available.--147 spot observations made at time of discharge measurements during period May 1949 to December 1965.

Extremes.--Discharge 1910-14, 1935-65: Maximum, 10,600 cfs June 3, 1948; minimum observed, 58 cfs Apr. 2, 1936.

Water temperatures 1949-65: Maximum observed, 73°F Aug. 1, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

168. Stillwater River near Absarokee, Mont. (6-2050)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
20-53	1200	34	21-51	1720	35	10-51	1600	44	17-53	1130	40	20-49	1530	47	22-49	1100	54
25-55	1200	32	18-53	1300	32	20-53	1230	38	26-55	1130	48	10-50	1330	54	13-50	1630	54
25-58	1700	32	23-54	1100	36	29-54	1300	37	26-56	1230	44	9-51	1300	53	6-51	1230	52
6-62	0815	32	11-61	1600	45	7-56	1400	32	23-57	1230	42	18-52	1630	55	18-51	1730	52
27-64	1410	32	26-62	1420	32	20-59	1330	44	21-59	1700	54	3-54	1200	38	10-52	1500	51
21-65	1130	34	12-63	1035	32	23-60	1100	42	6-60	1230	54	25-54	1200	51	15-53	1300	50
			25-63	1405	39	26-63	1250	41	24-62	1350	56	29-56	1830	48	15-54	1300	54
			24-64	1230	32	23-64	1400	33	27-64	1400	50	24-57	1600	54	9-55	1230	50
			18-65	1125	34	15-65	1025	35	2-65	1400	42	19-59	1830	46	6-57	1630	50
												28-60	1745	60	22-57	1430	50
												10-61	1315	61	16-59	1530	52
												31-62	1225	58	5-61	1830	56
												1-63	1320	50	17-62	1325	52
												28-63	1020	62	25-62	1420	55
												26-64	1150	54	14-63	1415	50
												24-65	1110	45	11-65	1415	56
															15-65	1040	48
															16-65	1220	49
															28-65	1420	53
July			August			September			October			November			December		
1-49	1130	66	9-50	1200	57	7-50	1600	62	16-50	1600	52	20-50	1520	34	28-50	1210	32
28-49	1500	61	27-51	1140	56	25-51	1200	48	25-51	1500	38	29-51	1130	35	28-51	1200	33
12-50	1230	52	21-52	1400	63	16-52	1200	54	14-52	1600	46	21-52	1200	34	3-54	1000	33
18-51	1530	62	28-53	1300	62	22-53	1000	53	4-54	1130	43	19-53	1100	32	27-55	1400	34
21-52	1530	60	24-54	1100	58	5-55	1300	64	6-55	1100	43	1-54	1200	38	24-57	1130	32
22-53	1200	59	4-55	1030	58	17-57	1200	51	15-56	1230	48	15-56	1200	32	23-58	1500	32
1-54	1230	59	21-57	1200	62	20-58	1500	56	16-57	1130	46	20-57	1230	32	31-59	1600	32
19-54	1100	62	18-58	1830	64	26-61	1000	46	28-63	1505	43	21-58	1430	40	26-62	1345	32
1-55	1100	56	13-60	1630	72	24-62	1525	58				25-60	1500	44	27-63	1330	32
4-56	0900	52	1-61	1500	73	24-63	1345	58				2-61	1000	32	23-64	1020	32
5-57	1730	58	28-61	1140	62	24-64	1400	57				27-61	1125	33	22-65	1300	33
27-57	1200	61	2-62	1230	60							2-62	1125	45			
15-58	1700	64	31-62	1055	52							27-62	1320	38			
13-60	1800	66	1-63	1145	62							24-63	1245	34			
13-61	1830	65	30-63	1225	60							16-65	1205	38			
10-63	1125	59	24-64	1130	57												
29-65	1500	65	25-65	1430	61												

169 . Clarks Fork Yellowstone River at Chance, Mont. (6-2075)

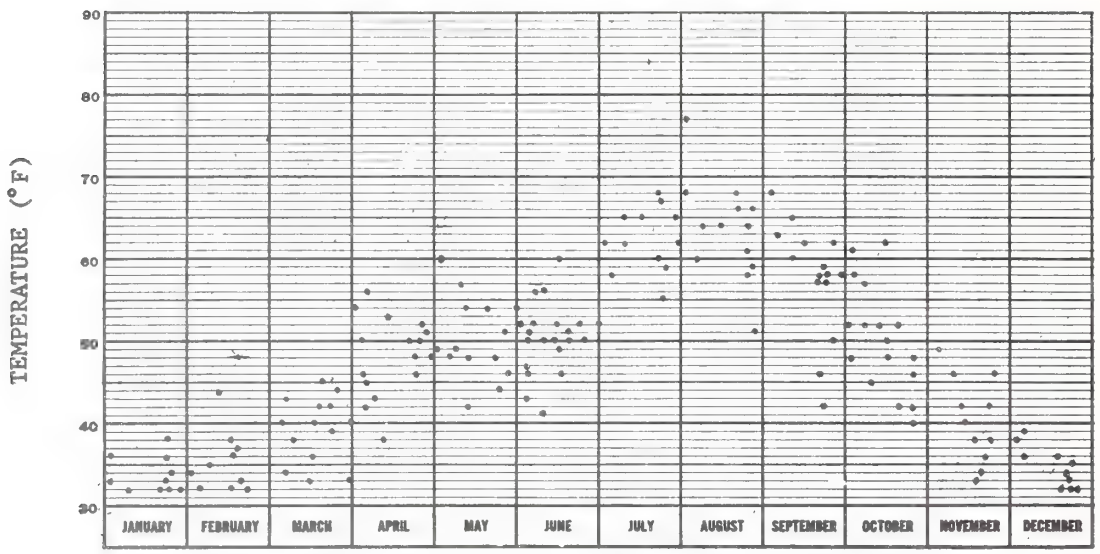
Location.--At gaging station, lat 45°00'40", long 109°04'00", in E½NE¼ sec.31, T.9 S., R.22 E., on left bank 0.4 mile upstream from Sand Coulee, three-quarters of a mile north of Montana-Wyoming State line, and at mile 78.5. Altitude of gage is 3,980 ft (from topographic map).

Drainage area.--1,154 sq mi.

Water temperature records available.--177 spot observations made at time of discharge measurements during period May 1949 to December 1965, including 25 observations made at time of water quality sampling.

Extremes.--Discharge 1921-65: Maximum observed, 10,900 cfs May 26, 1928; minimum observed, 32 cfs Apr. 26, 1961.

Water temperatures 1949-65: Maximum observed, 77°F Aug. 2, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

169. Clarks Fork Yellowstone River at Chance, Mont. (6-2075)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
24-51	1250	34	16-51	1700	38	23-51	1300	39	9-52	1600	43	13-49	1100	48	16-49	1000	60
22-53	1500	38	16-53	1200	36	18-53	1600	42	6-53	1400	45	11-50	1200	57	8-50	1400	41
18-58	1300	32	16-54	1500	36	22-54	1300	42	12-55	1500	38	12-52	1400	57	4-51	1630	51
2-60	1330	33	1-55	1130	34	14-55	1200	33	13-56	1400	53	13-53	1600	42	19-51	1730	51
29-62	1355	32	15-58	1600	32	21-56	0915	39	25-57	1500	48	31-53	1830	54	6-52	1700	52
2-63	1420	36	12-61	1030	44	26-57	1100	44	4-59	1130	46	4-54	1130	48	9-52	1130	50
25-63	1210	32	23-62	1510	32	8-58	1200	38	5-60	1530	56	19-55	1300	54	13-52	1030	50
9-63	1305	32	8-63	1055	35	18-59	1330	45	4-61	1430	42	1-56	1430	49	17-53	1600	50
23-64	1330	33	5-64	1900	32	16-62	1310	40	26-61	1530	50	28-56	1730	46	17-54	1430	51
22-65	1040	36	18-64	1400	33	31-62	1210	40	30-62	1545	48	21-59	1330	48	8-55	1300	56
			17-65	1320	37	7-63	1000	34	4-63	1655	50	2-61	1300	60	30-55	1200	52
						7-63	1430	43	23-63	1600	50	27-63	1845	51	11-56	1100	56
						5-64	1630	40	29-63	1345	51	8-64	1020	49	3-57	1900	47
						30-64	1630	33	1-64	1630	54	13-64	0940	54	25-57	1030	50
						16-65	0835	36	24-64	0930	46	25-65	1020	44	16-59	1800	46
									27-65	1435	52				4-60	1800	50
															21-60	1400	52
															8-61	1100	50
															16-62	1345	49
															4-63	0950	43
															5-63	1235	46
															1-64	1150	52
															29-64	1105	52
															16-65	1425	52
July			August			September			October			November			December		
16-52	1500	65	16-50	1300	64	20-49	1530	58	13-49	1530	52	17-50	1210	38	2-49	1030	38
23-53	1300	67	7-51	1730	60	26-51	1200	50	25-50	1100	48	23-53	1630	42	27-50	1300	32
22-54	1730	60	24-51	1730	61	10-52	1230	60	24-51	1100	42	13-56	1500	42	6-54	1430	36
29-55	1430	65	25-52	1100	58	23-53	1430	58	15-52	1500	48	21-57	1400	36	17-56	1500	36
6-57	1030	58	25-54	1330	64	27-54	1400	62	19-53	1400	52	17-58	1330	33	23-57	1300	32
25-57	1500	59	19-58	1500	68	3-55	1100	68	26-54	1300	46	11-60	1330	46	22-58	1200	32
21-60	1800	68	28-60	1200	66	20-57	1000	46	3-55	1600	58	20-61	1405	34	18-61	1555	32
11-61	1330	62	2-61	1100	77	19-58	1030	57	8-56	1700	52	26-62	1500	46	6-62	1520	39
11-62	1700	65	2-62	1440	68	30-60	1730	58	15-57	1600	50	4-63	1445	49	23-62	1350	33
2-63	1935	62	27-62	1430	59	22-61	1025	42	2-58	1300	61	13-63	1630	40	5-63	1830	39
30-63	1100	62	9-63	0800	64	15-62	1410	62	2-59	1100	48	23-65	0930	38	23-63	1330	35
23-65	0730	55	21-63	1500	66	17-62	1550	62	27-61	0830	40				22-64	1245	33
			29-64	1530	51	3-63	1600	68	1-62	1115	52				21-65	1335	34
			26-65	1010	59	11-63	1400	65	8-62	1625	45						
						23-63	1430	59	25-62	1415	46						
						5-64	1510	63	2-63	1340	61						
						23-64	1430	57	14-63	1415	62						
									7-64	1245	57						
									20-65	0905	42						

170. North Fork Bluewater Creek near Bridger, Mont.

Location.--At gaging station, lat 45°18'45", long 108°46'50", near center of sec.15, T.7 S., R.24 E., on right bank half a mile downstream from Lester Spring No. 1 and 6½ miles east of Bridger. Altitude of gage is 4,200 ft (from topographic map).

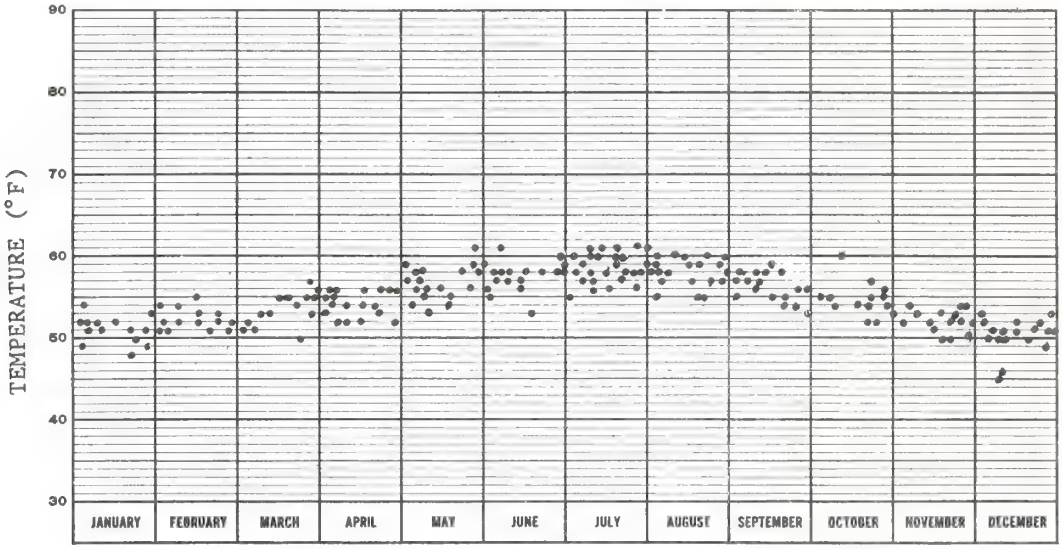
Water temperature records available.--280 spot observations made at time of discharge measurements and water quality sampling during periods March 1960 to April 1962, July to September 1962, May to July 1964, published in reports of the Geological Survey and republished in this report. Thermograph record during period July to December 1965 published in this report.

Spot observations made during periods Apr. 9 to June 30, 1962, and Oct. 18, 1963 to July 12, 1965, have not been used in this report.

Extremes.--Water temperatures 1960-62, 1964-65: Maximum observed, 61°F on scattered days in May to July 1961, 1962, 1964; minimum, 46°F Dec. 28, 29, 1965.

Remarks.--Water temperatures affected by springs upstream from station.

Cooperation.--Thermograph record furnished by Montana Fish and Game Commission.



Spot observations at time of discharge measurements and water quality sampling, 1960-62, 1964

Water temperatures at time of discharge measurements and water quality sampling

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-61	1035	49	1-61	0815	51	30-60	--	55	1-60	--	53	2-60	--	57	2-60	--	55
6-61	1100	51	3-61	1415	52	3-61	0950	51	5-60	--	56	6-60	--	54	6-60	--	58
9-61	1140	52	6-61	1030	51	6-61	1110	52	7-60	--	52	9-60	--	58	10-60	--	57
12-61	1440	51	10-61	1050	52	10-61	1515	53	11-60	--	54	13-60	--	56	13-60	--	57
14-61	1100	52	14-61	1140	53	13-61	1115	53	14-60	--	52	17-60	--	55	17-60	--	53
18-61	0910	51	17-61	0820	51	17-61	1115	55	18-60	--	56	21-60	--	58	20-60	--	58
20-61	1120	50	20-61	1500	53	21-61	0700	50	21-60	--	54	24-60	--	56	24-60	--	58
23-61	1030	50	24-61	1000	51	24-61	1030	55	22-60	--	54	27-60	--	56	27-60	--	58
26-61	1105	49	27-61	1415	52	27-61	1315	53	25-60	--	56	31-60	--	59	2-61	1645	56
2-62	0945	51	1-62	1500	54	30-61	1100	55	28-60	--	52	1-61	1250	59	5-61	1005	58

170. North Fork Bluewater Creek near Bridger, Mont.

Water temperatures at time of discharge measurements and water quality sampling--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
2-62	1030	52	2-62	0735	52	5-62	1150	51	3-61	1015	53	1-61	1330	59	7-61	0915	57
3-62	1330	54	6-62	1555	52	12-62	1520	53	6-61	1045	54	4-61	1030	56	9-61	1040	61
4-62	1320	52	9-62	1530	54	16-62	1505	55	7-61	1430	55	5-61	1335	58	12-61	1340	58
5-62	1330	51	13-62	1515	55	19-62	1410	54	10-61	1005	52	8-61	1500	56	14-61	0915	56
19-62	1045	48	15-62	1235	52	20-62	0830	53	14-61	1425	54	17-61	1605	54	16-61	1000	58
25-62	1330	51	21-62	1530	52	20-62	1445	56	18-61	0830	53	23-61	0900	56	23-61	1125	58
29-62	1400	53				21-62	1225	54	21-61	1050	56	23-61	1000	54	26-61	1700	58
						22-62	1130	54	24-61	1520	56	23-61	1430	60	29-61	1030	58
						23-62	1345	54	28-61	1030	56	25-61	1445	59	29-64	1305	60
						24-62	1405	55	2-62	1030	55	26-61	1300	61	30-64	1645	59
						25-62	1300	55	4-62	1645	56	29-61	1045	58			
						26-62	1520	55				31-61	1335	58			
						27-62	1120	57				4-64	1345	58			
						28-62	1215	55				7-64	1010	57			
						30-62	1400	56				8-64	1420	55			
												11-64	1040	51			
												11-64	1725	55			
July			August			September			October			November			December		
1-60	--	55	1-60	--	58	2-60	--	55	3-60	1120	55	4-60	0940	52	2-60	1345	53
5-60	--	58	4-60	--	55	6-60	--	58	7-60	1000	55	7-60	1030	54	5-60	1130	50
8-60	--	57	8-60	--	58	9-60	--	58	10-60	1400	54	10-60	1600	53	9-60	1105	50
11-60	--	58	12-60	--	60	12-60	--	58	14-60	1520	54	16-60	0830	51	12-60	1510	51
15-60	--	56	15-60	--	57	16-60	--	55	19-60	0825	52	21-60	1500	52	16-60	1445	52
18-60	--	60	19-60	--	55	20-60	--	54	21-60	1300	55	25-60	1400	54	20-60	0845	51
22-60	--	58	22-60	--	60	23-60	--	54	24-60	1315	56	29-60	1040	50	23-60	1130	52
29-60	--	58	26-60	--	59	26-60	--	56	29-60	1445	54	13-61	1500	52	27-60	1500	51
7-61	1000	59	29-60	--	58	30-60	--	56	31-60	1030	53	17-61	1500	53	30-60	1150	51
9-61	1155	60	3-61	1340	60	1-61	0905	57	2-61	1040	55	18-61	1045	50	1-61	1400	53
11-61	1115	56	4-61	1115	58	5-61	1430	58	6-61	1530	55	20-61	0950	50	4-61	1020	51
14-61	1015	58	7-61	1030	57	8-61	1445	58	9-61	1145	54	21-61	1300	53	4-61	1410	52
18-61	0945	57	11-61	1115	58	11-61	1710	56	13-61	1445	60	24-61	1245	52	7-61	0815	50
21-61	1205	60	14-61	1445	59	13-61	1405	58	17-61	0845	54	28-61	1145	54	7-61	1430	52
24-61	1020	58	18-61	0810	55	18-61	0710	55	20-61	1115	57	29-61	1300	50	11-61	1345	45
28-61	1020	58	21-61	1010	57	25-61	1640	56	23-61	1515	52	30-61	1400	53	12-61	1445	46
31-61	1145	59	25-61	0900	57	29-61	1035	53	27-61	1500	55				13-61	1345	50
3-62	1415	60	28-61	1210	60	4-62	1215	57	31-61	1450	54				14-61	1320	52
9-62	1350	61	3-62	1400	60	5-62	1625	58							15-61	1345	51
10-62	1305	61	3-62	1645	58	7-62	1300	59							18-61	1445	51
12-62	1320	60	6-62	1350	60	10-62	1345	57							19-61	1120	49
13-62	1110	60	13-62	1100	60	14-62	1250	59							19-61	1400	50
16-62	1515	59	16-62	1120	59	18-62	1300	58							20-61	1515	54
20-62	1400	60	20-62	1330	60										21-61	1415	52
23-62	1425	60	24-62	1345	60										22-61	1400	51

170. North Fork Bluewater Creek near Bridger, Mont.

Water temperatures at time of discharge measurements and water quality sampling--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
24-62	1205	60	31-62	1600	57										26-61	1200	52
25-62	1350	60	3-64	1120	59										27-61	1315	52
27-62	1340	56	7-64	1440	60										28-61	1010	49
1-64	1120	60													29-61	1400	53
2-64	1120	61															
3-64	1505	60															
6-64	1030	60															
10-64	0800	57															
10-64	1000	60															
13-64	1310	61															
17-64	1220	61															
21-64	1610	59															
23-64	1115	60															
27-64	1510	61															
31-64	1235	61															

Water temperatures (°F), July to December 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	60	59	59	59	59	59	60	59	62	59	60	59	59	60	60	60	60	60	59	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	50	57	57	57	57	57	57	57	58	57	57	57	57	57	57	57	57	57	56	--
August																																
Maximum.....	59	60	59	59	59	59	58	58	60	59	59	59	59	59	58	60	59	59	58	58	58	58	60	59	58	57	60	58	57	57	57	59
Minimum.....	56	57	57	57	57	56	56	56	57	57	57	57	57	56	56	57	57	57	56	57	57	57	56	56	56	56	56	56	55	55	55	56
September																																
Maximum.....	57	57	57	57	56	56	56	58	57	57	57	56	57	57	56	55	56	54	54	55	55	55	55	57	57	56	54	54	--	--	-	56
Minimum.....	55	56	55	55	55	55	55	55	56	56	55	55	56	55	55	53	53	52	52	52	53	53	53	53	54	54	52	53	--	--	-	54
October																																
Maximum.....	--	--	--	--	57	55	55	55	55	54	54	54	54	54	54	54	54	54	53	54	55	54	54	54	54	--	--	--	--	--	--	--
Minimum.....	--	--	--	--	54	54	55	55	55	53	53	53	54	54	54	53	53	53	53	53	54	54	54	54	54	--	--	--	--	--	--	--
November																																
Maximum.....	58	56	55	53	54	54	53	53	53	53	53	53	51	52	53	53	52	52	52	54	52	52	52	53	51	50	50	50	50	50	-	53
Minimum.....	55	55	53	53	53	53	52	51	52	53	53	51	51	51	52	52	52	52	52	52	52	52	51	52	50	50	50	50	50	50	-	52
December																																
Maximum.....	50	50	51	51	52	52	52	52	51	51	50	51	51	50	49	49	48	48	48	48	49	49	50	49	49	49	48	47	47	49	49	50
Minimum.....	50	50	50	51	51	52	52	51	51	50	50	51	50	50	49	48	48	48	47	47	48	49	49	49	49	48	47	46	46	47	49	49

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1965	Max	--	--	--	--	--	--	--	60	58	57	58	52
	Min	--	--	--	--	--	--	--	55	52	53	50	46

171. Bluewater Creek at Sanford Ranch, near Bridger, Mont. (6-2078.5)

Location.--At gaging station, lat 45°20'15", long 108°50'07", in SE¼SW¼ sec.6, T.6 S., R.24 E., on left bank at Sanford Ranch, half a mile north of county road, 4½ miles northeast of Bridger, and 8 miles upstream from mouth. Altitude of gage is 3,770 ft (from topographic map).

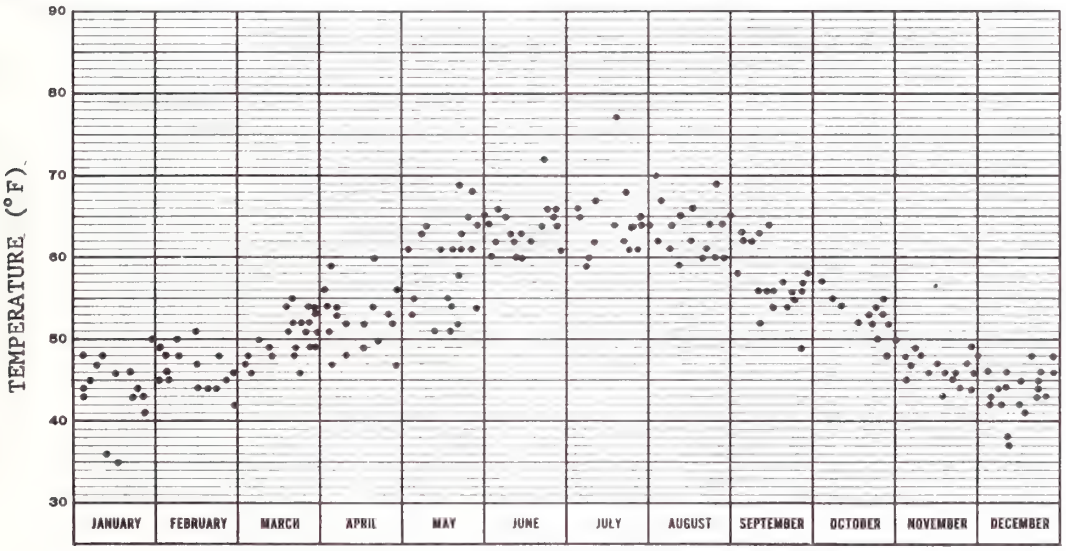
Drainage area.--43.9 sq mi.

Water temperature records available.--248 spot observations made at time of discharge measurements and water quality sampling during period March 1960 to April 1962 published in reports of the Geological Survey and republished in this report. Thermograph records during period July to December 1965 published in reports of the Geological Survey.

Spot observations during period April to September 1962 and thermograph record during period October 1963 to July 1965 have not been used in this report.

Extremes.--Water temperatures 1960-62, 1965: Maximum observed, 77°F July 18, 1960; minimum observed, 35°F Jan. 16, 1962.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations at time of discharge measurements or water quality sampling, 1960-62

Water temperatures at time of discharge measurements and water quality sampling

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-61	1215	43	1-61	0755	45	30-60	--	54	1-60	--	51	2-60	--	61	2-60	--	60
6-61	1135	45	3-61	1445	48	3-61	1155	47	5-60	--	54	6-60	--	55	6-60	--	66
9-61	1615	47	6-61	1100	45	6-61	1145	46	7-60	--	53	9-60	--	64	10-60	--	63
12-61	1525	48	10-61	1125	48	10-61	1545	50	11-60	--	52	13-60	--	61	13-60	--	60
12-61	1530	48	14-61	1215	47	13-61	1145	48	14-60	--	51	17-60	--	61	20-60	--	64
14-61	1130	46	17-61	1030	44	17-61	1145	51	18-60	--	60	21-60	--	58	24-60	--	65
18-61	1105	46	20-61	1535	48	21-61	0955	46	21-60	--	54	24-60	--	61	27-60	--	64
20-61	1145	43	24-61	1020	45	24-61	1100	52	22-60	--	50	27-60	--	54	2-61	1535	64
23-61	1100	44	27-61	1445	45	27-61	1345	49	25-60	--	52	31-60	--	65	5-61	1150	62
26-61	1140	41	28-61	0930	46	30-61	1130	51	28-60	--	47	4-61	1100	53	9-61	1055	65
2-62	1135	41	1-62	1330	49	5-62	1350	47	3-61	1055	51	8-61	1540	63	12-61	1250	62
2-62	1415	48	2-62	1000	49	8-62	1030	48	6-61	1015	47	12-61	1510	51	13-61	1015	60
3-62	1300	48	6-62	1520	46	12-62	1445	49	7-61	1500	54	16-61	1100	51	14-61	1020	63
4-62	1245	45	9-62	1500	50	16-62	1430	54	10-61	1045	48	16-61	1105	51	16-61	1105	62
5-62	1255	44	13-62	1440	51	19-62	1545	55	14-61	1450	49	17-61	1220	54	20-61	1410	72

171. Bluewater Creek at Sanford Ranch, near Bridger, Mont. (6-2078.5)
Water temperatures at time of discharge measurements and water quality sampling--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
12-62	1520	36	15-62	1400	44	20-62	1030	50	18-61	1015	54	17-61	1505	56	23-61	1220	66
16-62	1100	35	21-62	1445	44	20-62	1330	53	21-61	1125	54	17-61	1640	56	26-61	1600	66
25-62	1420	43	27-62	1445	42	21-62	1145	49	24-61	1615	53	18-61	1220	54	29-61	1000	61
29-62	1430	50				22-62	1110	48	28-61	1120	56	19-61	0825	52			
						23-62	1410	52	2-62	1300	56	23-61	1540	69			
						24-62	1345	52	4-62	1610	59	24-61	1920	61			
						25-62	1240	51				25-61	1400	63			
						26-62	1625	54				25-61	1600	64			
						27-62	1035	54				25-61	1745	63			
						28-62	1100	48				26-61	1040	61			
						30-62	1430	53				26-61	1515	69			
												26-61	1725	66			
												27-61	1735	68			
												29-61	1145	64			
												31-61	1425	64			
July			August			September			October			November			December		
5-60	--	66	1-60	--	64	2-60	--	58	3-60	1330	57	4-60	1020	48	5-60	1205	42
8-60	--	60	4-60	--	67	6-60	--	62	7-60	1000	55	7-60	1100	49	9-60	1140	44
11-60	--	67	8-60	--	64	9-60	--	62	10-60	1440	54	10-60	1630	48	12-60	1545	46
18-60	--	77	12-60	--	65	12-60	--	63	14-60	1600	52	16-60	1040	47	16-60	1515	45
22-60	--	68	15-60	--	62	16-60	--	56	19-60	1405	52	21-60	1540	46	20-60	1035	43
25-60	--	64	19-60	--	64	20-60	--	54	21-60	1355	54	29-60	1150	44	23-60	1215	46
29-60	--	65	22-60	--	69	23-60	--	56	24-60	1350	55	3-61	1155	45	27-60	1540	46
6-61	1100	65	26-60	--	64	26-60	--	57	29-60	1520	52	6-61	1450	47	27-60	1545	45
9-61	1130	67	29-60	--	65	30-60	--	58	31-60	1550	52	13-61	1430	46	30-60	1330	46
11-61	1030	59	3-61	1405	70	1-61	1000	58	17-61	0920	52	17-61	1400	43	1-61	1330	48
14-61	1050	62	4-61	1030	62	5-61	1615	63	20-61	1045	53	18-61	1215	46	4-61	1050	44
18-61	1145	64	7-61	1130	61	8-61	1545	63	23-61	1445	50	20-61	1325	45	4-61	1350	48
21-61	1050	62	11-61	1045	59	11-61	1620	56	27-61	1430	53	21-61	1210	44	7-61	0950	42
24-61	1145	61	14-61	1400	66	12-61	1515	52	30-61	1545	48	24-61	1125	47	7-61	1400	44
28-61	1110	61	18-61	1045	60	13-61	1335	56	31-61	1405	50	27-61	1545	47	11-61	1310	42
31-61	1115	64	21-61	1050	61	13-61	1440	57				28-61	1600	49	12-61	1410	38
			25-61	0945	60	14-61	1545	64				29-61	1340	46	13-61	1300	37
			28-61	1120	60	18-61	1000	57				30-61	1330	48	14-61	1230	44
						25-61	1545	56							15-61	1305	44
						29-61	1050	49							18-61	1415	42
															19-61	1105	41
															19-61	1330	44
															20-61	1445	48
															21-61	1350	43
															22-61	1320	44
															26-61	1130	45
															27-61	1245	45
															28-61	1415	43
															29-61	1330	48

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1965	Max	--	--	--	--	--	--	71	71	63	57	56	50
	Min	--	--	--	--	--	--	55	52	48	51	47	43

172. Bluewater Creek near Fromberg, Mont. (6-2078.7)

Location.--At gaging station, lat 45°21'55", long 108°52'00", in SW¼SE¼ sec.27, T.5 S., R.23 E., 100 ft downstream from bridge on county road, 2-3/4 miles southeast of Fromberg, and 4-3/4 miles upstream from mouth. Altitude of gage is 3,620 ft (from topographic map).

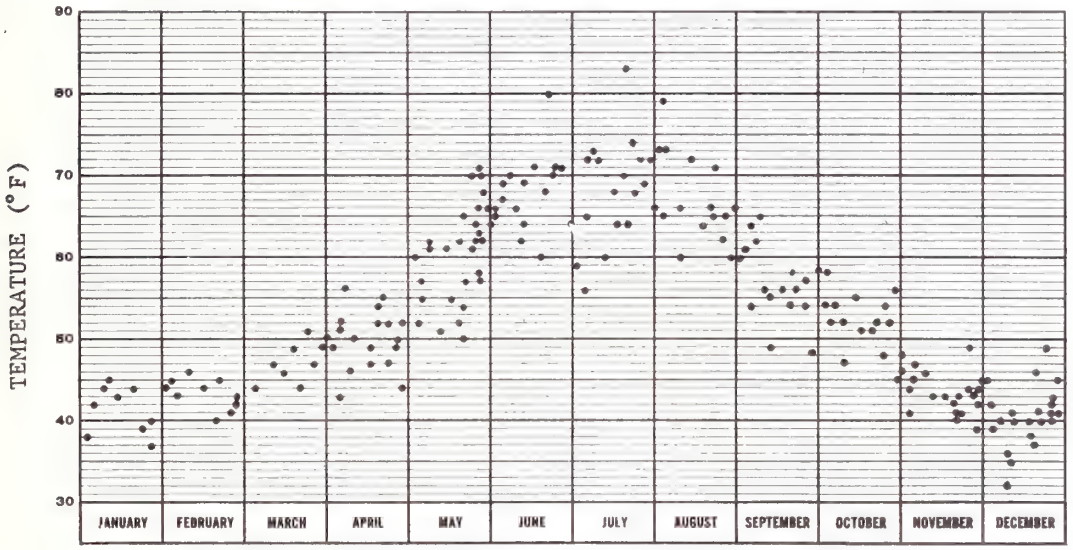
Drainage area.--46.6 sq mi.

Water temperature records available.--222 spot observations made at time of discharge measurements and water quality sampling during period March 1960 to December 1961 published in reports of the Geological Survey and republished in this report. Thermograph records during period July to December 1965 published in reports of the Geological Survey.

Spot observations made during period January to September 1962 and thermograph record during period October 1963 to July 1965 have not been used in this report.

Extremes.--Water temperatures 1960-61, 1965: Maximum observed, 83°F July 18, 1960; minimum observed, 32°F Dec. 11, 1961.

Cooperation.--Thermograph records furnished by Montana Fish and Game Department.



Spot observations at time of discharge measurements and water quality sampling, 1960-61

Water temperatures at time of discharge measurements and water quality sampling

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-61	1230	38	1-61	1010	44	31-60	--	50	1-60	--	49	2-60	--	60	2-60	--	65
6-61	1215	42	3-61	1500	45	3-61	1210	44	5-60	--	52	6-60	--	55	6-60	--	69
9-61	1630	44	6-61	1200	43	10-61	1600	47	7-60	--	56	9-60	--	62	10-60	--	66
12-61	1540	45	10-61	1145	46	13-61	1200	46	11-60	--	50	13-60	--	61	13-60	--	64
12-61	1545	45	14-61	1305	44	17-61	1200	49	14-60	--	49	17-60	--	62	17-60	--	60

172. Bluewater Creek near Fromberg, Mont. (6-2078.7)

Water temperatures at time of discharge measurements and water quality sampling--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
14-61	1145	43	17-61	1045	40	21-61	1015	44	18-60	--	54	21-60	--	65	20-60	--	68
18-61	1150	44	20-61	1600	45	24-61	1115	51	21-60	--	55	24-60	--	64	27-60	--	71
20-61	1200	39	24-61	1035	41	27-61	1400	47	22-60	--	47	27-60	--	54	2-61	1515	66
23-61	1115	40	27-61	1500	42	30-61	1145	49	25-60	--	50	31-60	--	66	5-61	1205	67
26-61	1200	37	28-61	0940	43				28-60	--	44	1-61	1735	62	9-61	1045	70
									3-61	1110	49	1-61	1805	62	12-61	1230	66
									6-61	0945	43	4-61	1130	52	13-61	1000	62
									7-61	1515	51	5-61	1255	57	14-61	1035	69
									10-61	1100	46	8-61	1555	61	16-61	1130	71
									14-61	1505	47	12-61	1525	51	20-61	1425	80
									18-61	1050	52	16-61	1125	50	23-61	1235	70
									21-61	1140	52	16-61	1130	50	26-61	1545	71
									24-61	1635	49	17-61	1230	51	29-61	0945	64
									28-61	1140	52	17-61	1520	52			
												17-61	1655	52			
												18-61	1235	52			
												19-61	0805	50			
												19-61	1110	57			
												23-61	1630	70			
												24-61	1935	61			
												25-61	1345	62			
												25-61	1545	66			
												25-61	1800	65			
												26-61	0905	58			
												26-61	1055	62			
												26-61	1745	68			
												27-61	1445	71			
												27-61	1645	70			
												29-61	1215	66			
												31-61	1445	64			
July			August			September			October			November			December		
1-60	--	59	1-60	--	73	2-60	--	61	3-60	1425	58	4-60	1040	44	2-60	1430	45
6-60	--	56	4-60	--	73	6-60	--	64	7-60	1110	54	7-60	1120	47	5-60	1225	39
8-60	--	65	12-60	--	66	12-60	--	65	10-60	1455	52	10-60	1650	46	9-60	1150	40
11-60	--	73	19-60	--	65	16-60	--	56	14-60	1615	51	16-60	1055	43	12-60	1600	41
15-60	--	64	22-60	---	71	20-60	--	54	19-60	1440	51	21-60	1610	41	16-60	1530	40
18-60	--	83	26-60	--	65	23-60	--	56	21-60	1405	52	25-60	1530	49	20-60	1110	40
22-60	--	74	29-60	--	66	26-60	--	57	24-60	1410	54	29-60	1235	39	23-60	1230	49
25-60	--	72	3-61	1415	79	30-60	--	58	29-60	1235	56	3-61	1140	41	27-60	1555	43
29-60	--	72	4-61	1000	65	1-61	1020	60	31-60	1700	48	6-61	1435	45	27-60	1600	43
6-61	1115	72	7-61	1200	67	5-61	1630	64	2-61	1220	54	13-61	1415	43	30-60	1410	41
9-61	1120	72	11-61	1030	60	6-61	0800	54	6-61	1430	52	17-61	1315	40	1-61	1315	45
11-61	1015	60	14-61	1330	72	8-61	1600	62	9-61	1100	47	18-61	1250	42	4-61	1105	41
14-61	1110	68	18-61	1100	64	11-61	1605	56	13-61	1400	55	20-61	1345	43	4-61	1335	44
18-61	1200	70	21-61	1115	66	12-61	1450	49	17-61	0935	51	21-61	1150	41	7-61	1000	39
21-61	1030	64	25-61	1000	62	13-61	1315	54	20-61	1030	51	24-61	1100	44	7-61	1345	40

172. Bluewater Creek near Fromberg, Mont. (6-2078.7)

Water temperatures at time of discharge measurements and water quality sampling--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
24-61	1200	68	28-61	1100	60	13-61	1455	56	23-61	1430	48	27-61	1530	43	11-61	1250	32
28-61	1125	69				18-61	1050	58	27-61	1415	52	28-61	1530	44	12-61	1400	36
31-61	1100	66				25-61	1530	54	30-61	1530	45	29-61	1350	42	13-61	1245	35
						29-61	1115	48	31-61	1350	46	30-61	1315	45	14-61	1215	40
															15-61	1250	41
															18-61	1400	38
															19-61	1015	36
															19-61	1315	38
															20-61	1420	46
															21-61	1335	41
															22-61	1305	40
															26-61	1115	41
															27-61	1230	42
															28-61	1430	40
															29-61	1315	45

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1965	Max	--	--	--	--	--	--	76	77	64	56	54	46
	Min	--	--	--	--	--	--	58	52	46	49	43	37

173. Bluewater Creek at Fromberg, Mont. (6-2079)

Location.--At gaging station, lat 45°22'58", long 108°54'03", in NW¼SW¼ sec.21, T.5 S., R.23 E., on left bank 0.3 mile upstream from mouth and 0.7 mile southeast of Fromberg. Altitude of gage is 3,535 ft (from topographic map).

Drainage area.--53.2 sq mi.

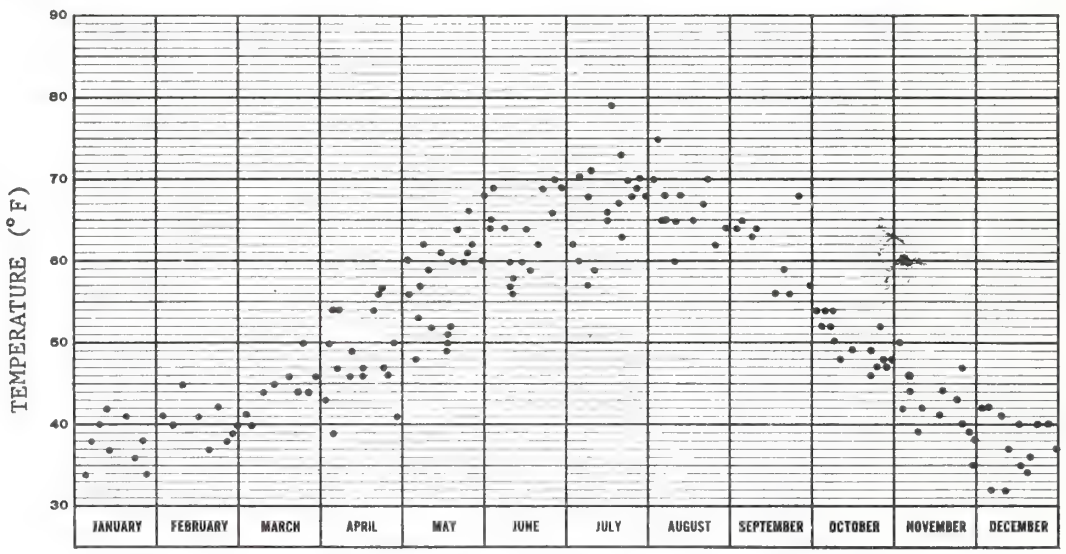
Water temperature records available.--184 spot observations made at time of discharge measurements and water quality sampling during periods April 1960 to August 1961 and October to December 1965 published in reports of the Geological Survey and republished in this report. Thermograph records during period July to December 1965 (incomplete) published in this report.

Spot observations made during periods August to September 1961, October 1962 to September 1963, October 1964 to July 23, 1965 and thermograph record during period Aug. 15, 1961, to September 1964 have not been used in this report.

Extremes.--Discharge 1961-64: Maximum, 560 cfs June 9, 1964; minimum, 4.4 cfs July 17, 1963.

Water temperatures 1960-61, 1964-65: Maximum observed, 79°F July 18, 1960; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations at time of discharge measurement and water quality sampling, 1960-61, 1964

Water temperatures at time of discharge measurements and water quality sampling

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
3-61	1325	34	1-61	1025	41	3-61	1320	41	1-60	--	43	2-60	--	56	2-60	--	64
6-61	1230	38	3-61	1515	41	6-61	1215	40	5-60	--	54	6-60	--	53	10-60	--	57
9-61	1645	40	6-61	1215	40	10-61	1615	44	7-60	--	54	9-60	--	59	13-60	--	60
12-61	1600	42	10-61	1210	45	13-61	1215	45	11-60	--	49	13-60	--	61	17-60	--	59
14-61	1200	37	14-61	1315	41	17-61	1215	46	14-60	--	47	17-60	--	60	20-60	--	62
18-61	1205	41	17-61	1100	37	21-61	1120	44	18-60	--	54	21-60	--	64	24-60	--	66
20-61	1210	36	20-61	1615	42	24-61	1130	50	21-60	--	57	24-60	--	62	27-60	--	69
23-61	1130	38	24-61	1050	38	27-61	1415	44	22-60	--	47	31-60	--	68	2-61	1445	65
26-61	1220	34	27-61	1515	39	30-61	1200	46	25-60	--	46	1-61	1835	60	5-61	1350	69
			28-61	0955	40				28-60	--	41	4-61	1140	48	9-61	1030	64

173. Bluewater Creek at Fromberg, Mont. (6-2079)

Water temperatures at time of discharge measurements and water quality sampling--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
									3-61	1130	50	5-61	1245	57	12-61	--	60
									6-61	0930	39	8-61	1610	62	13-61	0745	56
									7-61	1530	47	12-61	1540	52	14-61	1055	58
									10-61	1130	46	16-61	1150	49	16-61	1145	64
									14-61	1515	46	17-61	1250	50	20-61	1545	69
									18-61	1315	54	17-61	1530	50	23-61	1250	66
									21-61	1150	56	17-61	1705	50	26-61	1530	70
									24-61	1650	46	18-61	1245	51			
									28-61	1155	50	19-61	0735	49			
												19-61	1230	54			
												23-61	1725	66			
												24-61	1950	60			
												25-61	1330	60			
												25-61	1520	62			
												25-61	1830	61			
												26-61	0845	58			
												26-61	1115	61			
												26-61	1800	63			
												27-61	0905	58			
												27-61	1220	60			
												27-61	1315	64			
												31-61	1500	60			
July			August			September			October			November			December		
1-60	--	62	1-60	--	70	2-60	--	64	3-60	1445	54	4-60	1100	42	2-60	1445	42
6-60	--	60	4-60	--	75	6-60	--	65	7-60	1130	54	7-60	1130	46	5-60	1240	32
8-60	--	57	8-60	--	65	9-60	--	63	10-60	1510	50	10-60	1705	39	9-60	1210	32
11-60	--	71	12-60	--	65	12-60	--	64	14-60	1635	49	16-60	1110	41	12-60	1620	37
15-60	--	65	15-60	--	65	16-60	--	56	19-60	1545	46	21-60	1555	43	16-60	1545	35
18-60	--	79	19-60	--	67	20-60	--	59	21-60	1420	49	25-60	1545	47	20-60	1300	36
22-60	--	73	22-60	--	70	23-60	--	56	24-60	1430	52	29-60	1300	35	23-60	1245	40
25-60	--	68	26-60	--	62	26-60	--	68	29-60	1600	47	1-65	1700	50	27-60	1610	40
29-60	--	70	29-60	--	64	30-60	--	57	4-65	1150	52	8-65	1100	44	30-60	1440	37
6-61	1135	70	3-61	1430	75				5-65	1350	54	8-65	1220	44	6-65	1005	41
9-61	1100	68	4-61	0930	65				8-65	1315	52	12-65	1145	42	6-65	1320	43
11-61	1000	59	7-61	1215	68				11-65	1150	48	15-65	1335	44	10-65	1235	41
14-61	1130	66	11-61	1000	60				13-65	0930	49	19-65	1310	43	13-65	1015	40
18-61	1215	67	14-61	1300	68				19-65	1120	49	22-65	1325	40	17-65	1115	34
21-61	1015	63							22-65	0915	47	26-65	1025	39			
24-61	1230	70							25-65	0955	48	29-65	1105	38			
28-61	1110	69							29-65	1415	48						
31-61	1040	68															

YELLOWSTONE RIVER BASIN

173. Bluewater Creek at Fromberg, Mont. (6-2079)

Water temperatures (°F), July to December 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	74	68	70	73	73	72	72	72	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	63	63	62	64	65	64	65	65	--
August																																
Maximum.....	72	73	70	68	68	67	67	69	72	68	69	70	70	67	67	68	69	69	65	60	63	64	65	65	64	63	64	64	60	60	60	66
Minimum.....	65	67	65	64	63	63	64	65	65	64	66	67	65	63	63	62	62	62	60	57	57	58	60	60	58	57	57	58	57	56	55	61
September																																
Maximum.....	60	62	62	55	55	53	57	59	58	55	55	55	58	57	55	45	44	46	47	49	48	48	49	51	52	49	48	44	49	51	-	52
Minimum.....	55	56	53	51	51	51	51	55	55	53	53	54	54	55	45	43	42	42	43	45	47	46	46	46	49	46	44	43	43	46	-	49
October																																
Maximum.....	52	54	55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum.....	48	50	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
November																																
Maximum.....																																
Minimum.....																																
December																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	40	39	39	39	39	38	37	35	35	37	39	39	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	39	39	39	38	38	37	35	35	35	35	37	39	--

Summary of thermograph record

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1965 Max	--	--	--	--	--	--	--	73	62	--	--	--
Min	--	--	--	--	--	--	--	55	42	--	--	35

174. Clarks Fork Yellowstone River at Edgar, Mont. (6-2085)

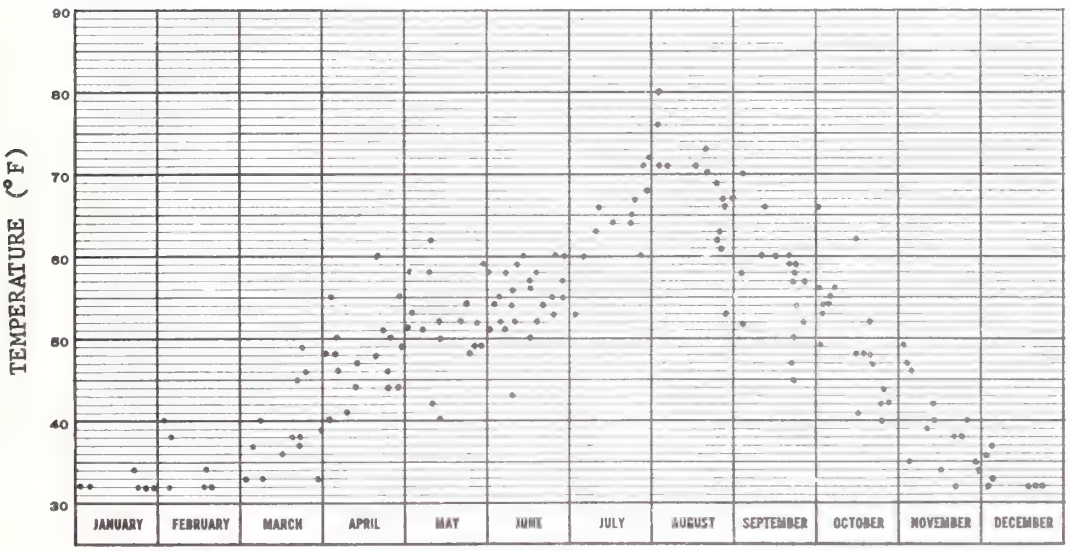
Location.--At gaging station, lat 45°28'00", long 108°50'30", in SE¼SE¼ sec.23, T.4 S., R.23 E., on right bank just downstream from highway bridge, half a mile east of Edgar, 6 miles upstream from Rock Creek, and at mile 27.0. Altitude of gage is 3,440 ft (by barometer).

Drainage area.--2,032 sq mi.

Water temperature records available.--191 spot observations made at time of discharge measurements during period April 1949 to December 1965, including 39 observations made at time of water quality sampling.

Extremes.--Discharge 1921-65: Maximum observed, 10,900 cfs June 2, 1936; minimum, 36 cfs Apr. 22, 1961.

Water temperatures 1949-65: Maximum observed, 80°F Aug. 2, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
23-51	1535	32	16-53	0930	32	27-52	1530	46	19-49	1500	60	13-49	1500	50	16-49	1430	57
22-53	1100	34	15-58	1330	32	18-53	1230	38	12-51	1200	44	11-50	1500	62	8-50	1830	43
2-60	0900	32	17-62	1430	34	22-54	1030	37	9-52	1230	41	10-51	1330	58	4-51	1200	52
29-62	1100	32	5-63	0820	38	21-56	1400	38	6-53	1100	46	13-52	1030	52	19-51	1250	54
3-63	1200	32	3-64	1715	40	8-57	1000	33	20-54	1600	48	23-52	1130	54	6-52	1200	52
25-63	1440	32	18-64	1100	32	8-58	1500	40	13-56	1100	47	13-53	1100	40	11-52	1430	56
6-64	1615	32	6-65	0925	32	22-59	1200	45	25-57	1200	44	31-53	1500	59	13-53	1230	56
23-64	1100	32	17-65	1130	32	31-62	0945	39	5-59	1400	46	14-54	1300	52	17-53	1900	58
4-65	1600	32				5-63	1225	37	29-60	1140	44	21-54	1730	52	17-54	1100	52
22-65	1400	32				7-63	1200	33	4-61	1700	48	1-56	1730	51	8-55	1800	58

174. Clarks Fork Yellowstone River at Edgar, Mont. (6-2085)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						23-63	1050	49	30-62	1305	49	29-56	1200	49	11-56	1500	59
						2-64	1615	33	1-63	1800	48	21-59	1700	54	3-57	1330	54
						30-64	1300	33	23-63	1315	51	2-61	1400	58	25-57	1500	53
						1-65	1315	33	29-63	1730	55	27-63	1630	52	10-59	1930	54
						16-65	1030	36	2-64	1510	40	7-64	0620	51	16-59	1230	56
									24-64	1200	46	11-64	1410	42	16-62	0945	50
									6-65	1505	55	27-64	1330	49	4-63	1710	55
									7-65	1030	50	3-65	1505	53	13-63	1500	60
									27-65	1030	50	25-65	1400	48	26-63	1205	60
															1-64	1605	58
															29-64	1735	60
															1-65	1535	51
															7-65	1600	51
															10-65	1210	52
															16-65	1540	57
															24-65	1530	55
															29-65	1200	55
															29-65	1625	57
July			August			September			October			November			December		
25-50	1600	67	6-49	1900	71	22-49	1300	57	14-49	1230	48	16-50	1325	34	2-49	1430	36
16-52	1000	64	28-50	1300	67	20-50	1200	60	18-50	1325	52	20-52	1530	38	6-54	1200	33
21-54	1500	64	24-53	1500	69	26-51	1530	52	24-51	1500	40	13-56	1200	42	17-56	1300	32
29-55	1030	68	25-54	1100	63	10-52	1000	60	15-52	1030	41	11-60	1600	39	23-57	1530	32
6-57	1430	60	15-57	1530	71	23-53	1100	58	19-53	1000	48	20-61	1035	32	22-58	1530	32
25-57	1130	60	19-58	1830	73	27-54	1130	57	26-54	1030	42	5-62	1430	46	18-61	1310	32
11-62	1430	66	28-60	1500	66	3-55	1400	70	3-55	1230	54	26-62	1245	40	4-62	1300	37
2-63	1715	53	2-61	1500	80	20-57	1200	47	28-55	1100	42	5-63	0835	35	23-62	1115	32
11-63	1425	63	2-62	1205	76	19-58	1330	59	8-56	1430	56	13-63	1330	40	3-63	1345	32
30-63	1500	72	27-62	1150	61	22-61	1430	50	17-57	1030	48	3-64	1440	47	23-63	1130	32
28-64	1500	71	21-63	1220	70	15-62	1120	60	2-58	1730	53	30-64	1525	34	22-64	1030	32
22-65	1810	65	3-64	1530	71	3-63	1910	52	2-59	1400	49	2-65	1455	49	21-65	1120	32
			29-64	1005	53	11-63	1130	66	1-60	1230	56	23-65	1125	38			
			31-64	1600	67	23-63	1415	59	27-61	1130	42	29-65	1325	35			
			2-65	1400	71	23-64	1000	54	5-62	0805	54						
			26-65	1300	62	3-65	0920	58	25-62	1200	44						
						22-65	1535	45	1-63	1350	66						
									14-63	1200	62						
									5-64	1645	54						
									20-64	1205	47						
									6-65	1800	55						

175. Rock Creek near Red Lodge, Mont. (6-2095)

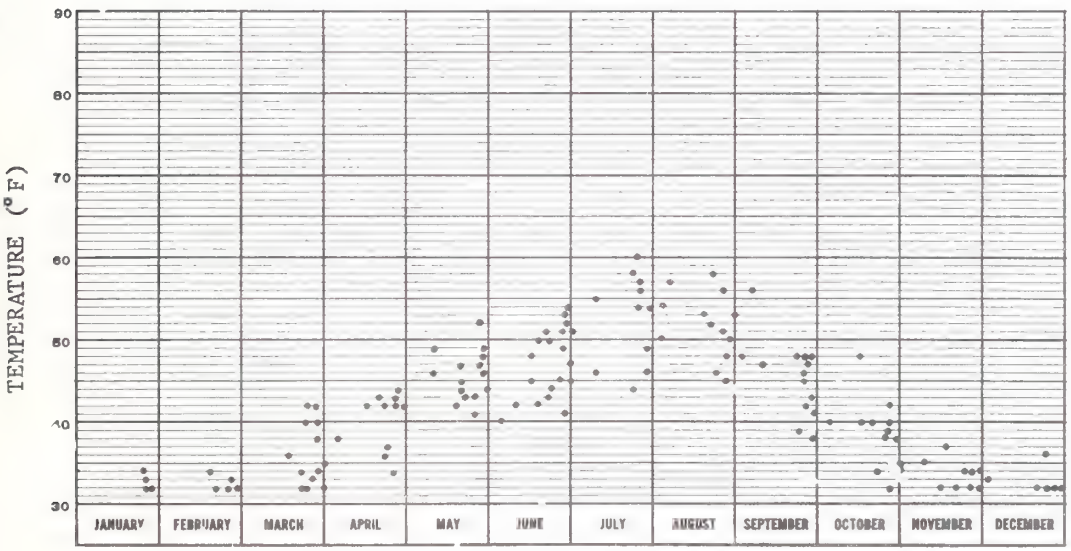
Location.--At gaging station, lat 45°07'15", long 109°17'45", in NW¼NW¼ sec.20, T.8 S., R.20 E., on left bank at downstream side of bridge, 3 miles upstream from West Fork and 5 miles southwest of Red Lodge. Datum of gage is 6,100.52 ft above mean sea level, datum of 1929.

Drainage area.--124 sq mi.

Water temperature records available.--158 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1932, 1934-65: Maximum, 3,110 cfs June 4, 1957; minimum observed, 14 cfs Nov. 29, 1954.

Water temperatures 1949-65: Maximum observed, 60°F July 23, 1949; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

175. Rock Creek near Red Lodge, Mont. (6-2095)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
25-51	1200	32	27-58	1100	32	27-52	1030	33	14-49	1630	42	12-49	1630	49	15-49	1330	48
21-53	1630	34	24-62	1030	32	19-53	0900	32	23-51	1600	37	23-50	1230	43	29-50	1200	47
24-55	1100	32	25-63	1045	33	23-54	1100	32	6-53	1630	38	21-51	1300	44	20-51	1800	44
25-62	0910	32	18-64	1630	32	29-55	1100	34	20-54	1030	36	20-52	1500	44	13-52	1330	48
25-63	0845	32	17-65	1620	34	22-56	1200	34	25-55	1130	42	30-52	1530	46	20-52	1630	50
23-64	1540	32				26-57	1330	42	19-56	1200	43	21-53	1500	45	29-52	1400	54
22-65	0815	33				28-58	1030	38	28-57	1130	44	30-53	1800	48	16-53	1700	50
						27-59	1500	33	26-61	1300	43	20-54	1430	47	18-54	1400	50
						28-60	1245	40	29-62	1245	42	31-55	1100	44	26-54	1700	51
						22-61	1600	40	24-63	0850	34	30-56	1530	44	20-55	1600	51
						16-62	1645	36	23-64	1500	42	19-57	1230	42	28-56	1600	53
						31-62	1500	35	27-65	1635	42	29-60	1730	49	19-57	1800	43
						23-63	1535	42				27-61	1525	48	28-57	1100	41
						31-64	0930	32				28-63	1430	52	29-58	1700	52
						15-65	1640	36				12-64	1615	46	30-59	1230	45
												26-64	1600	43	30-60	1145	52
												24-65	1610	41	30-61	1100	51
															17-62	2005	42
															22-62	0925	43
															5-63	0905	40
															27-63	0935	45
															11-65	0915	42
															14-65	1800	45
															28-65	1755	49
July			August			September			October			November			December		
23-49	1800	60	7-49	1500	57	26-49	1200	46	28-49	1100	39	15-50	1210	32	1-49	1700	33
24-50	1730	54	17-50	1200	53	25-50	1330	48	19-50	1130	40	20-52	1100	32	23-52	1230	32
23-53	1730	56	19-52	1530	52	2-51	1600	48	26-51	1130	32	23-53	1300	34	30-56	1200	32
28-55	1100	46	25-53	1430	56	11-52	1130	47	17-52	1200	40	29-54	1230	32	28-57	1100	32
30-57	1230	54	26-54	1030	51	24-53	1130	45	21-53	1500	34	30-56	1230	34	29-58	1030	32
21-60	1300	58	3-56	1100	50	28-54	1200	43	27-54	1030	35	27-57	1200	32	24-62	0935	32
26-61	1200	57	30-56	1100	44	2-55	1000	48	5-55	1100	40	12-60	1100	35	23-63	1540	32
12-62	0935	46	29-57	1230	48	26-56	1100	48	25-56	1200	38	20-61	1550	32	22-64	1415	36
10-63	1625	55	31-60	1300	53	27-57	1130	47	29-57	1100	38	27-62	0830	34	21-65	1600	32
30-63	0830	49	21-61	1730	58	30-58	1130	41	31-58	1130	35	14-63	0900	37			
23-65	0920	44	2-62	1715	54	29-59	1130	38	31-59	1130	34	22-65	1515	34			
			27-62	1725	51	29-60	1400	48	26-60	1640	42						
			22-63	0835	46	21-61	1630	39	26-61	1525	40						
			29-64	1715	50	11-63	1600	56	26-62	0800	34						
			26-65	0810	45	24-63	0740	42	14-63	1600	48						
						23-64	1600	48									
						22-65	0950	39									

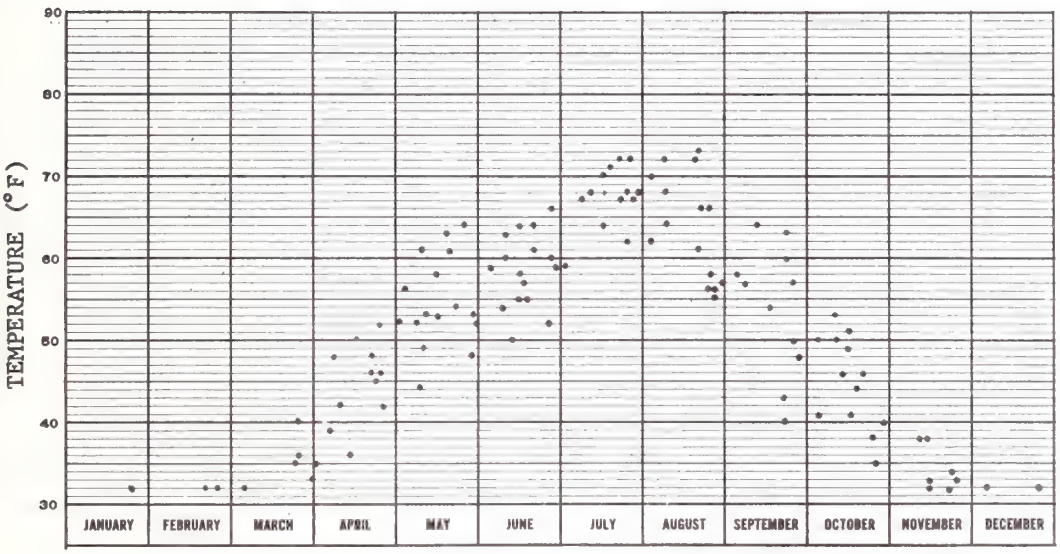
176. Red Lodge Creek above Cooney Reservoir, near Boyd, Mont. (6-2110)

Location.--At gaging station, lat 45°26'16", long 109°15'10", in SE¼SE¼ sec.33, T.4 S., R.20 E., on right bank just upstream from Cooney Reservoir, 9 miles west of Boyd. Datum of gage is 4,248.0 ft above mean sea level, datum of 1929.

Drainage area.--143 sq mi.

Water temperature records available.--122 spot observations made at time of discharge measurements during period April 1949 to December 1965 (no winter records for most years).

Extremes.--Discharge 1937-65: Maximum, 1,360 cfs June 17, 1957 (does not include some possible bypass flow); no flow for many days in 1949.
Water temperatures 1949-65: Maximum observed, 73°F Aug. 20, 1958; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

176. Red Lodge Creek above Cooney Reservoir, near Boyd, Mont. (6-2110)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
24-62	1515	32	24-62	1600	32	23-54	1330	35	19-49	1100	48	10-49	1130	61	14-49	1100	58
24-64	1000	32	19-64	0930	32	25-57	1300	40	11-51	1230	42	12-50	1500	53	27-50	1330	60
						25-58	1230	36	7-52	1200	39	8-51	1330	52	15-51	1300	64
						6-63	1100	32	16-53	1630	50	14-52	1500	58	5-52	1500	59
						24-63	0935	40	21-54	1230	45	15-53	1500	53	18-53	1630	64
						31-64	1330	33	13-55	1400	36	30-53	1400	52	16-54	1300	57
									24-56	1300	42	20-55	1300	61	10-55	1200	60
									24-57	1500	42	17-56	1400	63	13-57	1300	50
									8-61	1500	48	28-56	1730	48	26-57	1500	52
									1-62	1000	35	22-59	1600	54	11-59	1200	60
									24-63	1425	52	3-61	1400	56	12-61	1200	63
									23-64	1250	46	1-62	1415	52	16-62	1935	55
									6-65	1100	39	29-63	1115	53	9-63	1410	54
									20-65	1035	46	12-64	1320	49	20-63	1450	61
												25-64	1440	64	27-63	1515	66
												11-65	1255	44	15-64	1435	58
															14-65	1600	55
															29-65	1800	59
July			August			September			October			November			December		
28-50	1330	67	28-51	1330	55	23-49	1530	63	11-50	1350	53	14-50	1145	32	3-54	1330	32
24-51	1300	68	20-52	1030	61	27-51	1430	48	29-51	1600	40	24-53	1300	33	4-62	1230	32
17-52	1630	71	25-53	1030	58	15-52	1230	54	16-52	1100	41	14-56	1200	33	24-63	0935	32
24-53	1130	62	24-54	1430	66	22-53	1330	60	20-53	1200	46	19-57	1200	32			
20-54	1000	67	18-55	1400	72	5-56	1430	58	5-54	1130	41	12-60	1600	38			
15-55	1030	64	8-56	1300	68	8-60	1200	57	27-54	1530	35	14-63	1130	38			
2-56	1300	59	8-57	1330	72	21-61	1255	40	4-55	1230	50	22-65	1145	34			
15-60	1500	70	20-58	1730	73	16-62	1025	54	12-56	1330	50						
12-62	1340	68	8-60	1300	64	12-63	1050	64	18-57	1230	44						
9-63	1615	67	3-61	1200	70	24-63	1225	57	14-60	1700	46						
29-63	1500	68	3-62	0930	62	24-64	1025	50	26-61	1245	38						
27-64	1430	72	28-62	1110	56	21-65	1320	43	26-62	0950	38						
23-65	1330	72	22-63	1300	66				15-63	1205	51						
			30-64	1230	57				15-65	1505	49						
			25-65	0900	56												

177. Willow Creek near Boyd, Mont. (6-2115)

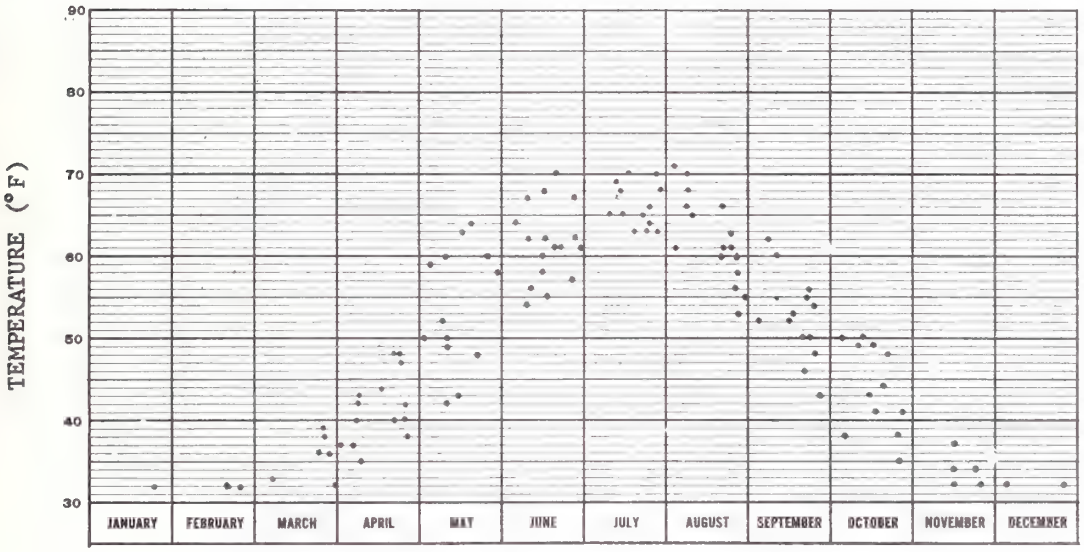
Location.--At gaging station, lat 45°25'20", long 109°13'50", in SW¼SW¼ sec.2, T.5 S., R.20 E., on left bank half a mile upstream from Cooney Reservoir and 8 miles west of Boyd. Altitude of gage is 4,260 ft (from topographic map).

Drainage area.--53.3 sq mi.

Water temperature records available.--121 spot observations made at time of discharge measurements during period April 1949 to December 1965 (no winter records for most years).

Extremes.--Discharge 1937-65: Maximum, 848 cfs June 17, 1957; minimum recorded, 0.4 cfs Nov. 26, 1948.

Water temperatures 1949-65: Maximum observed, 71°F Aug. 3, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

177. Willow Creek near Boyd, Mont. (6-2115)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
24-62	1345	32	24-62	1100	32	25-57	1530	39	15-49	1330	44	10-49	1330	60	14-49	1230	60
24-64	1100	32	19-64	1130	32	25-58	1430	38	11-51	1630	43	12-50	1700	50	27-50	1630	62
						27-59	1300	36	7-52	1400	40	8-51	1200	52	15-51	1100	62
						6-63	0955	33	7-53	1230	35	14-52	1300	63	5-52	1200	64
						24-63	1055	36	21-54	1100	40	14-53	1600	43	18-53	1730	70
						31-64	1230	32	24-56	1400	42	17-56	1500	64	16-54	1400	55
									24-57	1630	40	22-59	1800	48	10-55	1330	62
									24-59	1500	38	3-61	1700	59	12-56	1600	56
									8-61	1400	42	1-62	1325	50	13-57	1500	56
									1-62	1120	37	29-63	0935	58	26-57	1200	57
									24-63	1300	47	12-64	1325	49	11-59	1400	67
									23-64	1140	48	25-64	1600	60	14-60	1800	68
									6-65	1210	37	11-65	1155	42	22-62	1215	61
									20-65	1205	48				9-63	1500	54
															20-63	1555	61
															27-63	1400	67
															15-64	1630	58
															14-65	1455	62
															29-65	1655	61
July			August			September			October			November			December		
28-50	1500	63	8-49	1400	65	23-49	1330	56	27-49	1200	41	14-50	1430	32	4-62	1130	32
24-51	1100	64	28-50	1030	58	27-51	1200	43	11-50	1135	49	24-53	1100	32	24-62	1405	32
17-52	1800	63	28-51	1530	53	15-52	1400	52	16-52	1300	41	14-56	1400	34	24-63	1030	32
24-53	1330	66	20-52	1200	60	22-53	1500	55	20-53	1430	48	14-63	1230	37			
20-54	1200	65	26-53	1200	60	5-56	1300	52	5-54	1000	38	22-65	1300	34			
14-55	1400	65	24-54	1600	61	23-57	1200	50	27-54	1400	35						
15-60	1800	70	8-56	1100	70	8-60	1500	62	4-55	1530	50						
13-61	1200	68	8-57	1500	68	21-61	1200	46	12-56	1430	50						
12-62	1230	69	22-57	1630	63	16-62	0915	53	18-57	1400	44						
9-63	1510	65	20-58	1930	66	12-63	1050	60	14-60	1830	43						
29-63	1225	68	8-60	1530	66	24-63	1115	54	26-61	1155	38						
27-64	1315	70	3-61	1300	71	24-64	0930	48	26-62	1020	38						
23-65	1200	63	3-62	1035	61	21-65	1440	50	15-63	1035	49						
			28-62	1015	53				15-65	1400	49						
			22-63	1150	61												
			30-64	1100	55												
			25-65	1000	56												

178 . Red Lodge Creek below Cooney Reservoir, near Boyd, Mont. (6-2125)

Location.--At gaging station, lat 45°27'00", long 109°11'10", in N½NW¼ sec.31, T.4 S., R.21 E., on right bank 400 ft upstream from Cottonwood Creek, 1 mile downstream from Cooney Dam, and 6 miles west of Boyd. Altitude of gage is 4,140 ft (from topographic map).

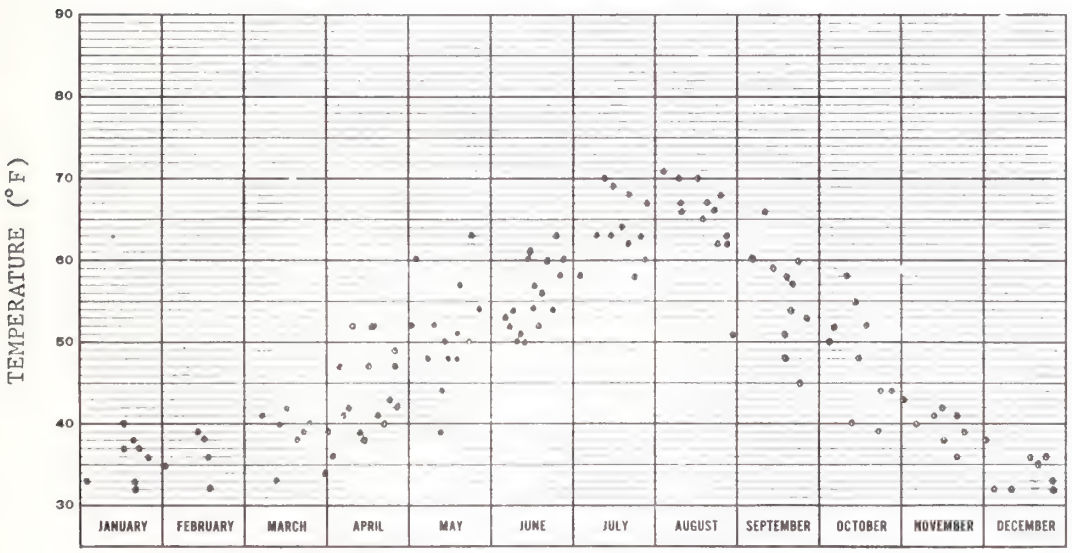
Drainage area.--210 sq mi.

Water temperature records available.--133 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1937-65: Maximum, 3,590 cfs June 17, 1957; no flow Oct. 6, 7, 1948.

Water temperatures 1949-65: Maximum observed, 71°F Aug. 3, 1961; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures may be affected by storage in Cooney Reservoir. Water is drawn from bottom of reservoir.



Spot observations of water temperatures, 1949-65

178. Red Lodge Creek below Cooney Reservoir, near Boyd, Mont. (6-2125)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
25-51	1530	37	19-51	1700	36	19-53	1300	42	15-49	1130	47	10-49	1500	52	14-49	1430	60
21-53	1500	40	17-53	1030	39	14-55	1700	33	12-51	1800	39	22-50	1130	50	28-50	1600	58
28-56	1500	36	1-55	1500	35	22-56	1000	38	7-52	1530	42	8-51	1600	48	15-51	0930	54
24-58	1730	32	19-64	1300	32	8-57	1130	41	16-53	1430	52	14-52	1100	50	5-52	1800	53
2-60	1600	33	18-65	0940	38	25-57	1030	40	2-54	1100	36	15-53	1230	48	18-53	1300	56
24-62	1135	38				24-63	1210	39	21-54	1500	40	19-55	1600	57	16-54	1530	52
24-63	1415	33				31-64	1500	34	13-55	1200	38	17-56	1130	48	10-55	1030	50
24-64	1430	32				15-65	1515	40	24-56	1100	42	3-61	1230	60	12-56	1030	50
21-65	1510	37							24-57	1200	47	18-61	1200	51	26-57	1100	54
									5-60	1200	47	1-62	1510	52	11-59	1000	51
									8-61	1130	52	29-63	1230	54	14-60	1300	61
									1-62	1255	39	12-64	1500	44	7-61	1400	52
									24-63	1125	49	25-64	1300	63	9-63	1255	54
									23-64	1030	43	11-65	1055	39	20-63	1315	60
									6-65	1300	41				27-63	1210	63
									20-65	1345	41				15-64	1330	57
															29-65	1515	60
July			August			September			October			November			December		
28-50	1700	60	8-49	1130	66	23-49	1100	57	27-49	1400	44	14-50	1630	38	1-49	1400	38
24-51	1600	58	28-50	1300	63	27-51	1700	53	29-51	1200	44	24-53	1500	39	26-50	1530	36
22-53	1600	62	28-51	1100	62	15-52	1530	59	16-52	1500	48	1-54	1600	43	10-52	1300	32
20-54	1530	64	20-52	1500	65	22-53	1630	58	20-53	1600	52	14-56	1100	42	28-57	1430	33
14-55	1200	63	27-53	1030	68	5-56	1200	60	5-54	1400	52	6-59	1530	40	4-62	1025	32
2-56	1000	58	26-54	1400	62	23-57	1100	54	4-55	1100	50	12-60	1400	41	24-62	1515	35
15-60	1230	69	18-55	1100	70	21-61	1045	48	12-56	1130	58	21-61	1100	36	24-63	1130	32
13-61	1000	70	8-56	0930	70	12-63	0920	66	26-61	1110	39	14-63	1500	42	22-65	0830	36
9-63	1350	63	8-57	1130	67	24-63	1025	60	15-63	0930	55	22-65	1025	41			
29-63	1120	67	8-60	1100	70	24-64	0805	45	15-65	1630	40						
27-64	1600	63	3-61	1500	71	21-65	1540	51									
23-65	1450	68	22-63	1030	67												
			30-64	1000	51												
			25-65	1105	66												

179. Rock Creek at Joliet, Mont. (6-2135)

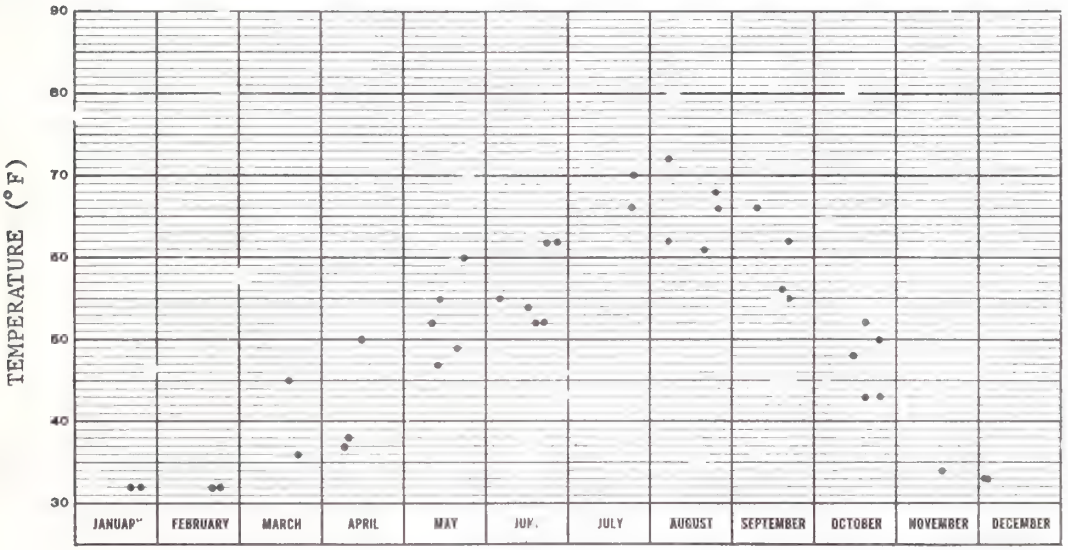
Location.--At gaging station, lat 45°28'30", long 108°59'50", in SE¼NW¼ sec.22, T.4 S., R.22 E., at bridge on U. S. Highway 212 at Joliet, 4 miles downstream from Red Lodge Creek and 10 miles upstream from mouth. Altitude of gage is 3,780 ft (from topographic map).

Drainage area.--539 sq mi.

Water temperature records available.--39 spot observations made at time of discharge measurements during period April 1949 to October 1953.

Extremes.--Discharge 1945-53: Maximum, 1,930 cfs June 6, 1952; minimum daily, 18 cfs Feb. 11, 1949.

Water temperatures 1949-53: Maximum observed, 72°F Aug. 6, 1949; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
24-51	1630	32	19-51	1430	32	23-51	1600	36	15-49	1630	50	20-49	1400	49	22-49	1500	62
21-53	1230	32	17-53	1230	32	19-53	1530	45	11-52	1000	38	22-50	1400	60	28-50	1230	62
									7-53	1600	37	10-51	1700	62	15-51	1300	62
												13-52	1400	55	22-51	1130	52
												14-53	1300	47	4-52	1100	55
															16-53	1200	54
															19-53	1800	52
July			August			September			October			November			December		
25-50	1300	66	6-49	1700	72	22-49	1700	62	14-49	1600	48	16-50	1700	34	1-49	1030	33
27-53	1300	70	28-50	1430	66	19-51	1130	56	18-50	1600	52						
			7-51	1220	62	10-52	1530	66	26-51	1700	43						
			19-52	1000	61	23-53	0930	55	25-52	1330	50						
			27-53	1200	68				21-53	1000	43						

180. Yellowstone River at Billings, Mont. (6-2145)

Location.--At gaging station, lat 45°46'25", long 108°28'30", in SW¼SE¼ sec.2, T.1 S., R.26 E., near left bank at city of Billings water department intake, 1 mile east of Billings, 12 miles upstream from Prior Creek, and at mile 347.8. Datum of gage is 3,096.09 ft above mean sea level (city of Billings water department bench mark).

Drainage area.--11,783 sq mi.

Water temperature records available.--357 spot observations made at time of discharge measurements during period April 1949 to December 1965 (prior to Jan. 10, 1963, at site 1-3/4 miles downstream). Once-daily observations made during periods December 1951 to February 1958 (winter records fragmentary) and July 1963 to December 1965 published in reports of the Geological Survey. Once-daily observations made during period January 1934 to December 1965 at city of Billings water works published in this report.

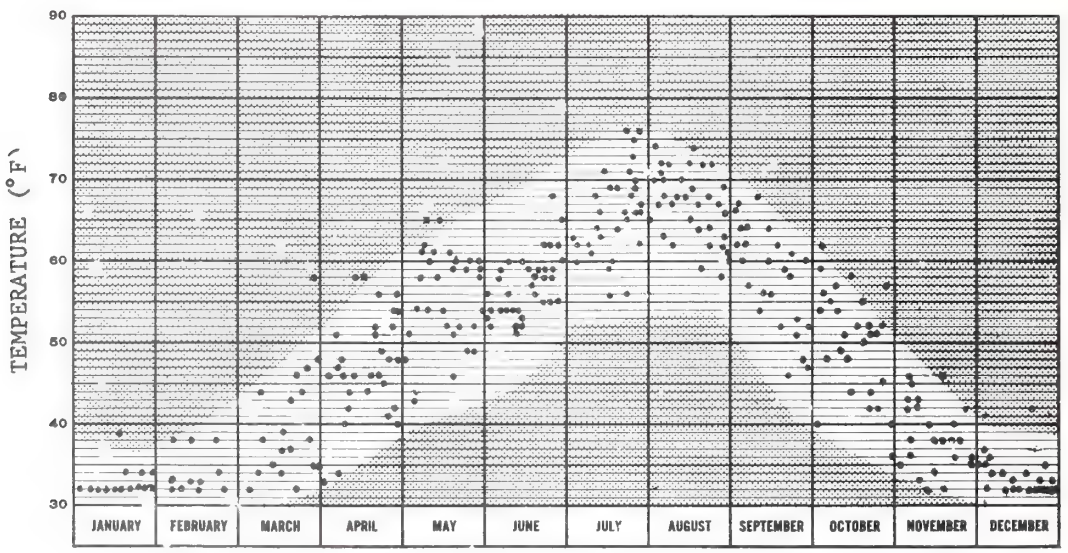
Once-daily observations made during period March to September 1958 published in reports of the Geological Survey have not been used in this report.

Extremes.--Discharge 1904-5, 1928-65: Maximum observed, 64,800 cfs June 27, 1944; minimum, 430 cfs Dec. 12, 1932.

Water temperatures 1934-65: Maximum observed, 80°F July 24, 1955; minimum, freezing point on many days during winter months.

Remarks.--Temperatures published in Geological Survey reports were taken between 3 and 5 p.m. Those taken by the city of Billings water department were made about 8 a.m.

Cooperation.--Some data supplied by city of Billings.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations at city of Billings Water Works, 1934-65.

180. Yellowstone River at Billings, Mont. (6-2145)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
18-51	0915	34	15-52	1500	38	14-52	1600	35	12-49	1030	46	2-49	1200	51	1-49	1230	53
19-52	1100	32	9-53	1200	38	9-53	1455	44	25-51	1000	41	11-49	1400	62	21-49	1130	62
31-52	1030	32	26-54	1000	38	23-53	1630	43	7-52	1600	51	19-49	1230	46	30-49	1530	60
22-53	1100	34	27-[illegible]1	1100	34	30-53	1450	58	11-53	1100	44	26-50	0815	50	6-50	1430	58
29-53	1030	34	17-62	1110	33	9-54	1000	38	21-53	1530	56	18-51	1130	60	12-51	1110	60
7-58	1600	32	28-62	1455	32	19-54	1000	39	29-53	1500	54	19-52	1500	54	26-51	1040	55
17-58	1530	39	8-63	1130	33	30-54	1530	35	8-54	1000	46	23-52	1530	54	2-52	1100	54
28-58	1500	32	15-63	1045	33	31-55	1100	35	20-54	1430	49	9-53	1100	52	8-52	0830	56
2-63	1220	32	10-64	1100	32	28-56	1400	38	28-54	1530	48	19-53	1630	59	18-52	1200	56
15-63	1540	32	17-64	1130	32	17-59	1130	37	18-55	1100	46	6-54	1000	54	2-54	1500	52
25-63	1330	32	28-64	1300	32	26-59	1100	44	30-55	1030	56	12-54	1000	60	11-54	1000	53
9-64	1100	32	8-65	1525	32	24-60	1130	46	11-56	1010	42	21-54	1100	55	21-54	1030	59
16-64	1400	32				31-61	1030	48	19-56	1100	51	7-55	1100	58	26-54	1200	62
12-65	1125	32				19-62	1120	39	27-56	1200	42	18-55	1100	55	6-55	1130	54
21-65	1415	32				8-63	1040	34	3-58	1200	46	26-55	1200	49	20-55	1200	59
29-65	1425	32				15-63	1115	34	14-58	1600	58	4-56	1100	43	29-55	1200	62
						29-63	1515	47	25-58	1200	48	15-56	1200	54	18-56	1130	58
						6-64	1000	32	9-59	1500	40	27-56	1130	60	24-57	1030	59
						20-64	1400	38	20-59	1600	45	31-56	1500	54	17-59	1100	57
						22-65	1515	32	30-59	1200	54	10-57	1530	54	26-59	1130	58
									28-60	1020	40	22-57	0850	49	10-60	1100	54
									19-61	1745	52	30-57	1100	59	29-60	1100	65
									27-61	1700	52	7-58	1100	56	6-61	1500	59
									17-62	1530	58	26-58	1700	60	16-61	1200	59
									8-63	1200	48	8-59	1700	58	27-61	1300	68
									19-63	0940	46	18-59	1130	51	8-62	1600	60
									8-64	1100	34	29-59	1100	52	9-63	1000	54
									1-65	1030	33	11-60	1030	65	21-63	1100	58
									7-65	1040	37	16-60	1030	52	1-64	1000	56
									17-65	1035	44	30-60	1100	60	8-64	1230	54
												9-61	1630	61	10-64	1030	52
												8-62	1600	56	21-64	1015	55
												17-62	1500	58	10-65	1025	51
												2-63	1445	52	12-65	1050	52
												13-63	1500	58	28-65	1100	55
												17-63	1510	61			
												24-63	0820	58			
												30-63	1400	58			
												1-64	1100	48			
												8-64	1500	52			
												14-64	1555	65			
												12-65	1520	61			
												21-65	1215	52			

180. Yellowstone River at Billings, Mont. (6-2145)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
29-49	1300	67	6-49	1100	71	21-49	1300	59	4-49	1700	54	29-49	1500	42	1-50	0915	35
14-50	1200	60	8-50	1130	63	7-51	1030	60	2-50	1230	40	20-50	1500	32	21-50	1130	42
22-50	0730	62	18-50	1030	64	17-51	1100	56	13-50	0905	58	30-51	1030	35	10-51	1100	32
26-51	1100	64	6-51	1110	67	26-51	1130	51	26-50	1100	52	7-52	1530	45	8-52	1500	34
7-52	1130	61	16-51	1300	65	9-52	1030	62	8-51	1235	57	17-52	1600	40	31-52	1130	32
21-52	1130	65	29-51	1100	58	19-52	1530	60	22-51	1100	42	20-53	1100	32	3-54	1500	32
6-53	1100	62	8-52	1630	68	29-52	1600	60	31-51	1120	36	30-53	1100	36	13-54	1500	32
17-53	1000	65	18-52	1000	67	9-53	1130	59	8-52	1500	55	5-54	1030	42	23-54	1030	33
8-54	1100	64	28-52	1100	67	18-53	1500	62	20-52	1545	51	17-54	1030	46	5-57	1630	34
16-54	1000	66	7-53	1500	72	28-53	1600	60	29-52	1530	57	24-54	1030	40	19-57	1600	32
26-54	1030	69	17-53	1515	74	3-54	1030	66	19-53	1030	51	10-55	1500	43	30-57	1530	33
8-55	1130	68	28-53	1030	67	10-55	1130	58	28-53	1100	46	16-55	1430	32	26-59	1100	35
18-55	1030	72	16-54	1530	69	22-55	1100	52	6-54	1500	48	2-56	1200	35	4-61	1340	36
27-55	1600	75	25-54	1100	64	30-55	1100	52	15-54	1000	44	23-56	1200	36	3-62	1335	35
20-56	1000	66	8-55	1000	72	17-56	1030	60	12-55	1000	48	7-57	1600	38	14-62	1600	32
3-57	1030	60	22-55	1100	72	25-56	1100	56	21-55	1030	52	25-57	1500	38	17-62	1345	34
9-57	1100	63	30-56	1500	62	6-57	1000	62	31-55	1500	40	5-58	1600	43	10-63	1530	32
18-57	1600	68	5-57	1100	70	16-57	1030	58	10-56	1530	54	7-61	1200	36	26-63	1500	32
26-57	1030	69	12-57	1030	70	23-57	1600	58	22-56	1700	44	5-62	1430	46	18-64	1235	32
2-58	1100	63	26-57	1100	62	5-58	1130	62	3-57	1100	59	21-62	1330	38	24-64	1030	32
14-58	1030	64	14-58	1100	68	15-58	1030	56	15-57	1100	52	12-63	1150	33	3-65	1505	37
25-58	1130	73	25-58	1200	68	25-58	1200	53	29-57	1530	45	19-63	1430	38	13-65	1255	33
17-59	1100	65	10-59	1100	67	14-59	1300	68	10-58	1630	49	10-64	1405	42	22-65	1150	32
27-59	1100	70	17-59	1600	72	28-59	1500	48	17-58	1630	52	18-64	1525	34	30-65	1000	32
18-60	1800	76	5-60	1300	74	6-60	1730	67	27-58	1600	45	18-65	1205	38			
14-61	1300	69	15-60	0945	69	26-60	1200	58	8-59	1500	46						
27-61	1130	76	26-60	1800	64	8-61	1200	64	19-59	1230	50						
3-62	1000	62	11-61	1200	68	18-61	1200	62	26-59	1500	50						
10-62	1520	71	22-61	1110	72	10-62	1630	57	5-60	1100	56						
13-62	1415	69	30-61	1100	69	28-62	1410	63	14-60	1200	46						
23-62	1540	71	1-62	1045	65	9-63	1430	64	28-60	1700	46						
9-63	1225	66	10-62	1030	62	23-63	1100	61	3-61	1030	50						
26-63	1155	66	31-62	1120	60	17-64	1555	64	16-61	1200	55						
17-64	1100	56	23-63	1105	67	30-64	1210	56	25-61	1000	42						
24-64	1000	56	30-63	1300	66	13-65	1050	54	4-63	1215	62						
13-65	0730	59	7-64	1000	70	23-65	1530	46	16-64	1540	52						
21-65	0825	66	21-64	1630	59	30-65	1520	47	11-65	1215	51						
			31-64	1125	61				29-65	1100	48						
			22-65	1205	68												
			30-65	1420	63												

180. Yellowstone River at Billings, Mont. (6-2145)

Summary of once-daily temperature readings at gaging station

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1950	Max	--	--	--	--	--	--	--	--	--	--	--	--
	Min	--	--	--	--	--	--	--	--	--	--	--	32
1951	Max	36	38	45	60	68	63	76	72	65	58	45	45
	Min	32	32	32	40	45	41	51	59	48	35	32	32
1952	Max	38	38	44	63	67	67	73	73	69	67	46	36
	Min	32	32	32	42	46	55	60	58	58	45	32	32
1953	Max	40	42	50	59	63	66	75	75	71	57	49	40
	Min	32	32	32	35	43	51	63	63	58	44	35	32
1954	Max	35	40	45	59	61	65	78	73	71	60	44	36
	Min	32	32	34	38	40	52	60	60	44	40	36	32
1955	Max	38	38	36	59	68	66	80	79	72	60	48	36
	Min	32	32	32	32	48	54	58	68	45	43	32	32
1956	Max	37	38	48	56	63	66	76	77	68	63	--	--
	Min	32	32	33	38	44	57	60	56	48	35	32	--
1957	Max	--	--	50	60	67	64	74	77	70	64	46	47
	Min	--	--	--	36	47	50	60	63	50	40	32	32
1958	Max	39	46	--	--	--	--	--	--	--	--	--	--
	Min	32	33	--	--	--	--	--	--	--	--	--	--
1963	Max	--	--	--	--	--	--	70	74	68	60	43	35
	Min	--	--	--	--	--	--	--	62	57	40	32	32
1964	Max	32	32	41	52	60	60	69	69	59	54	47	32
	Min	32	32	32	39	44	49	58	54	49	42	32	32
1965	Max	32	32	33	56	58	55	66	69	60	53	46	40
	Min	32	32	32	33	43	50	55	56	42	45	32	32

Summary for years 1950-58, 1963-65

	Max	40	46	50	63	68	67	80	79	72	67	49	45
	Min	32	32	32	32	43	41	51	54	38	35	32	32

180. Yellowstone River at Billings Water Works, at Billings, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1934																																
January	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	35	35	35	34	34	34	35	35	34	34	34	34	35	36	37	38	36	39	38	37	37	35	34	34	33	32	32	32	-	-	-	35
March	34	35	35	36	34	34	34	35	34	34	36	39	37	36	34	35	35	35	39	43	44	43	41	40	39	39	39	38	38	38	39	37
April	39	42	43	44	45	47	48	48	49	50	50	50	50	49	49	49	49	49	49	49	51	53	53	56	57	56	57	57	61	59	-	50
May	57	57	58	56	57	58	61	59	59	57	56	56	54	54	54	58	59	61	60	60	60	61	59	60	61	64	65	66	66	66	62	59
June	62	62	61	62	62	61	60	60	59	59	61	62	63	63	61	61	62	64	63	62	62	63	62	63	62	63	63	63	63	63	-	62
July	64	64	68	69	65	63	64	65	66	67	67	68	69	69	69	70	70	70	71	72	72	72	72	72	72	71	66	68	70	69	72	71	68
August	71	70	70	71	71	71	71	71	70	70	69	69	66	65	65	66	66	66	65	65	65	63	60	58	58	59	59	60	59	58	60	65
September	60	60	60	59	60	59	60	59	59	58	59	59	59	58	56	57	57	58	56	50	48	47	46	42	40	40	41	42	46	46	-	53
October	48	49	48	49	49	49	49	51	52	52	52	51	52	50	50	49	47	47	47	47	48	48	46	46	44	44	43	43	41	41	41	48
November	41	41	40	39	39	39	40	41	41	41	40	40	40	40	39	39	39	39	39	38	36	36	34	34	34	33	33	33	32	32	-	38
December	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Water temperatures (°F); calendar year 1935																																
January	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	36	38	39	39	39	40	40	40	--	--	--	--	--	--	--
April	34	34	34	34	34	34	33	33	34	34	37	41	41	41	44	44	43	44	50	52	52	52	53	52	52	52	48	50	49	49	-	43
May	48	48	48	50	49	50	46	52	53	54	54	54	52	50	50	52	52	54	54	54	54	58	58	58	59	60	59	58	58	57	58	53
June	58	58	57	58	58	57	58	60	60	62	63	62	63	60	61	62	62	62	60	58	58	62	62	62	62	59	59	60	63	62	-	60
July	62	64	64	64	64	64	64	65	65	68	69	69	69	69	70	72	70	70	71	70	68	70	70	71	71	71	72	73	73	70	71	68
August	72	69	72	70	70	69	70	70	71	72	70	68	70	72	69	68	63	63	64	63	64	64	65	65	65	65	64	63	62	62	62	67
September	60	60	62	62	60	61	61	60	60	60	61	61	61	61	61	61	62	60	59	59	60	60	61	60	58	52	49	51	51	54	-	59
October	54	54	54	54	54	56	56	56	51	51	48	48	50	48	48	48	47	46	46	46	45	42	38	38	38	42	41	40	38	33	33	46
November	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	32
December	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Water temperatures (°F), calendar year 1936																																
January	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	32
March	32	33	33	34	34	34	33	35	37	38	36	36	32	36	37	34	35	37	38	39	39	38	38	38	38	36	36	36	35	36	35	36
April	32	36	35	35	35	36	35	36	35	36	36	38	44	45	47	52	53	53	53	52	53	53	53	53	54	54	53	50	50	50	-	45
May	50	56	58	58	57	52	48	48	54	54	60	60	59	56	58	58	60	59	59	56	56	56	57	59	60	60	63	60	60	62	63	57
June	61	58	54	52	54	56	54	58	56	58	57	57	60	62	63	64	64	64	62	64	64	66	68	68	70	70	72	72	70	68	-	62
July	67	68	70	70	70	72	73	74	75	76	74	74	70	68	70	70	72	72	73	74	74	74	74	73	74	74	72	72	70	70	72	72
August	73	72	72	68	68	68	68	70	72	73	73	72	72	70	72	70	69	69	66	65	65	64	64	64	65	65	64	63	64	66	65	69
September	64	66	65	64	64	64	64	63	63	63	62	60	60	61	57	54	53	52	52	56	56	57	57	58	57	54	52	52	52	52	-	58
October	51	50	50	50	48	48	49	49	52	52	52	53	53	53	52	50	49	50	50	48	44	44	42	42	42	42	42	42	42	42	41	48
November	40	36	36	34	33	33	33	34	33	34	33	34	34	34	38	38	37	38	39	40	38	38	36	36	35	35	36	35	36	36	-	36
December	35	35	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	34	34	36	35	35	32	32	32	32	32	32	33

180. Yellowstone River at Billings Water Works, at Billings, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1937																																
January	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March	32	32	32	32	33	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	35	35	33
April	35	38	38	40	41	43	43	43	43	47	48	47	48	48	50	51	48	47	47	50	50	47	46	46	47	48	49	50	49	49	-	48
May	50	52	52	54	56	56	57	57	58	58	57	57	55	56	56	56	56	55	56	58	56	52	54	55	56	56	58	58	54	54	54	55
June	54	55	56	54	53	52	52	53	54	55	56	56	55	55	56	58	58	59	59	58	59	60	60	62	62	60	62	62	64	65	-	57
July	66	66	66	68	69	66	63	66	66	66	67	68	68	67	68	68	68	68	70	70	72	72	72	72	70	70	71	72	72	71	69	69
August	68	67	66	67	67	68	68	69	67	68	68	68	69	69	68	67	68	68	68	65	66	66	68	66	66	66	68	68	62	62	62	67
September	64	64	66	64	64	61	60	60	61	60	60	60	62	61	62	63	64	64	63	63	62	60	59	58	53	52	53	53	53	51	-	60
October	50	53	58	55	52	49	48	47	54	54	52	52	52	48	50	48	50	49	49	50	50	51	51	52	52	52	51	51	50	51	50	51
November	48	47	44	43	42	42	42	40	42	42	42	44	42	40	40	38	37	32	32	32	34	34	34	34	34	34	34	--	--	--	-	39
December	33	33	35	35	36	36	36	36	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
Water temperatures (°F), calendar year 1938																																
January	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March	32	33	33	33	33	--	32	32	32	32	34	34	--	40	42	42	42	42	42	42	40	40	40	42	42	42	42	44	42	39	38	36
April	39	37	38	37	37	36	37	38	38	44	44	45	46	48	49	51	52	54	53	51	48	48	50	--	50	50	50	52	54	54	-	46
May	58	57	57	55	55	52	50	50	50	50	51	51	52	51	58	58	57	56	55	55	--	56	--	56	56	57	--	--	58	58	54	55
June	54	55	55	55	56	56	54	54	52	50	54	54	54	52	52	54	58	60	--	60	62	63	63	63	62	60	62	63	64	63	-	57
July	64	64	62	63	63	62	63	64	64	65	66	66	67	67	66	65	66	66	67	70	70	70	68	66	65	66	66	69	70	70	70	66
August	72	72	72	69	68	69	70	70	70	69	69	68	70	68	67	66	66	65	65	64	64	63	63	63	63	63	64	64	65	65	64	67
September	64	63	64	64	65	64	63	64	63	60	60	62	62	62	62	62	62	60	61	61	62	62	62	64	64	64	64	64	63	63	63	-	63
October	62	60	60	58	57	57	56	54	54	54	52	52	52	52	50	50	50	50	46	44	42	42	42	44	45	46	46	48	48	48	48	51
November	47	47	46	46	42	42	42	40	41	41	40	39	38	35	35	35	36	38	38	38	36	35	33	32	32	32	36	36	36	36	-	38
December	36	36	36	36	36	36	36	36	36	36	38	36	34	34	34	34	34	34	32	32	32	32	32	32	36	32	32	32	32	32	32	34
Water temperatures (°F), calendar year 1939																																
January	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	--	34	33	33	33	40	44	41	40	45	38	40	43	45	35
April	43	44	48	48	44	40	--	44	44	44	42	44	44	46	42	42	53	53	54	56	57	54	56	56	57	58	59	59	60	60	-	50
May	58	54	56	56	56	56	56	48	50	51	50	49	52	54	58	58	58	58	58	56	54	54	54	54	54	54	--	58	64	65	61	55
June	60	58	56	60	60	60	61	59	60	59	58	57	58	59	57	57	58	56	56	58	60	60	62	60	62	62	62	64	66	60	-	59
July	68	68	66	66	66	66	62	64	66	67	71	74	74	74	74	72	72	72	73	73	70	68	70	66	67	69	70	71	72	72	68	70
August	68	66	67	68	70	70	67	66	64	62	62	62	62	64	68	70	68	68	68	62	62	62	61	63	65	68	68	69	70	70	70	66
September	71	68	64	64	63	62	61	57	57	58	58	60	59	58	57	57	58	57	58	56	57	57	57	57	55	55	55	54	52	54	-	59
October	54	59	58	54	52	52	50	50	50	50	50	51	51	50	52	46	46	47	45	44	50	51	49	48	41	41	42	42	42	41	41	48
November	40	40	40	44	44	42	42	42	42	42	40	40	39	39	39	39	38	38	38	38	38	38	38	37	36	36	35	35	35	34	-	39
December	34	38	38	38	38	39	38	38	38	40	40	39	39	38	38	38	38	39	38	38	38	36	34	34	32	32	32	33	34	--	--	37

180. Yellowstone River at Billings Water Works, at Billings, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1940																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	33	34	34	33	34	34	34	33	32	32	32	32	32	--	--	--	--	--	--	--	--	--	--	--	-	-	-	--
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	42	42	42	37	37	43	43	42	40	40	41	42	42	46	36
April.....	42	42	42	42	40	40	44	42	43	42	40	40	42	46	46	44	44	44	44	49	50	46	47	47	48	48	48	48	49	51	-	45
May.....	52	54	54	55	55	54	55	55	56	56	58	59	60	58	55	--	56	52	53	56	56	56	58	58	58	59	58	56	56	--	--	56
June.....	60	60	59	57	56	54	54	52	50	51	52	54	56	56	63	64	65	64	62	63	62	64	60	63	64	64	65	65	65	66	-	60
July.....	72	72	72	72	70	72	67	70	70	70	72	72	73	73	73	73	73	73	73	73	70	74	75	76	75	74	64	63	68	67	65	71
August.....	64	62	64	72	69	70	70	72	72	72	70	68	70	69	70	66	66	64	64	66	66	66	66	68	69	69	67	66	66	64	64	67
September....	63	64	65	65	66	65	65	64	63	57	57	59	61	62	60	60	60	60	60	60	60	58	59	59	58	58	57	57	--	--	-	61
October.....	--	--	45	45	56	51	51	48	48	48	49	49	54	52	52	52	52	52	52	55	58	54	56	53	53	55	55	54	50	--	48	52
November.....	--	47	--	--	43	38	36	37	36	36	34	32	32	32	32	32	34	34	33	32	32	32	32	32	33	33	32	32	32	32	-	34
December.....	32	32	32	32	34	34	34	34	36	35	33	32	--	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
Water temperatures (°F), calendar year 1941																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March.....	32	32	32	33	33	33	34	34	35	34	36	35	34	33	33	32	32	32	33	33	33	36	34	34	37	39	39	39	42	44	46	35
April.....	46	44	44	44	46	46	45	46	46	47	47	48	48	48	50	50	42	42	42	42	--	--	48	52	49	47	50	50	52	52	-	47
May.....	54	56	58	58	58	57	58	54	54	55	60	60	62	62	62	62	59	55	--	54	54	--	--	--	60	58	56	56	56	--	58	58
June.....	59	59	59	58	58	58	58	56	54	53	54	56	58	60	60	61	62	63	63	60	60	62	--	66	66	66	66	66	66	67	-	60
July.....	67	65	64	64	64	68	70	70	70	70	68	68	62	64	68	--	70	--	71	72	71	71	71	70	69	69	68	68	67	67	67	68
August.....	66	66	68	68	69	69	70	70	72	72	--	69	69	69	--	68	68	68	68	67	66	--	66	65	65	65	64	64	64	64	64	67
September....	62	62	62	60	60	59	58	53	52	61	55	55	55	56	55	52	53	54	54	56	55	50	50	52	50	52	48	46	48	48	-	54
October.....	48	46	47	48	47	41	43	48	46	45	45	46	50	48	48	48	48	48	48	47	46	48	50	50	50	50	47	47	46	42	40	47
November.....	40	40	40	42	42	42	41	41	38	40	38	41	41	40	40	40	42	40	37	36	34	33	32	33	32	32	--	33	33	33	-	38
December.....	34	34	37	37	38	38	38	34	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
Water temperatures (°F), calendar year 1942																																
January.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March.....	32	--	--	--	--	--	--	--	--	--	33	34	35	36	34	34	34	34	36	36	36	37	39	38	38	38	--	37	37	38	38	34
April.....	38	40	40	42	42	41	42	43	44	44	45	46	46	53	52	49	50	50	48	49	53	56	52	49	48	48	48	48	48	48	-	47
May.....	48	48	48	48	49	50	51	52	52	54	56	56	52	50	50	48	47	44	46	50	53	56	58	60	59	58	58	57	54	52	53	52
June.....	53	55	56	57	56	56	56	58	58	56	56	54	54	56	57	54	54	55	54	54	56	56	58	58	58	58	56	--	57	57	-	56
July.....	58	60	62	64	64	64	66	64	64	64	65	64	63	64	64	65	66	65	66	65	64	66	66	67	67	68	68	66	67	66	66	65
August.....	66	66	66	66	66	--	67	68	68	68	69	69	67	64	62	63	64	65	66	66	66	66	65	67	67	66	65	65	64	63	62	64
September....	60	59	60	62	64	63	64	64	62	62	62	59	60	59	59	59	56	53	50	49	49	52	55	54	53	52	52	50	50	52	-	56
October.....	--	--	--	--	52	52	52	52	53	53	55	55	53	50	48	48	48	48	47	49	50	50	49	49	40	40	40	40	40	40	38	48
November.....	40	38	38	37	37	35	35	35	36	36	36	37	37	38	38	39	38	38	37	37	36	38	36	38	36	36	36	35	34	34	-	37
December.....	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	34	34	33	33	33	34	34	33	33	33	34	32	32	32	32	32	33

180. Yellowstone River at Billings Water Works, at Billings, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1943																																
January	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	34	32	32	32	32	32	32	32	32	-	-	-	32
March	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	34	34	36	38	34
April	40	40	42	44	44	47	49	52	51	52	52	50	50	48	50	50	53	51	52	53	55	50	50	51	52	48	47	47	47	46	-	47
May	48	48	48	50	51	52	52	52	50	48	46	44	44	46	46	49	46	47	50	53	56	56	56	54	54	54	56	57	56	57	57	51
June	57	56	56	54	54	50	50	52	54	58	58	56	--	52	53	53	54	56	58	58	56	58	57	56	57	58	58	58	59	60	-	55
July	61	61	60	60	58	58	60	62	60	62	62	61	57	57	58	57	59	60	60	64	64	65	65	65	65	65	66	66	67	67	67	62
August	67	67	66	64	65	65	66	66	64	66	65	66	66	66	65	64	65	65	66	66	65	65	65	64	64	64	64	64	65	65	63	65
September	61	61	58	57	56	54	54	50	47	50	--	56	58	62	56	56	56	56	56	56	56	55	55	54	55	55	55	56	58	58	-	56
October	58	57	56	56	56	55	55	54	54	54	54	54	52	50	48	48	48	48	48	48	47	47	47	42	42	43	42	44	43	43	44	50
November	42	40	39	40	40	38	38	38	37	37	37	37	38	38	38	38	38	38	38	38	40	38	40	38	38	37	34	34	36	36	-	38
December	36	36	37	36	36	36	34	34	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34
Water temperatures (°F), calendar year 1944																																
January	34	34	33	32	32	32	32	32	32	32	32	32	32	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	32
March	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	36	37	37	38	34	34	33	34	36	33
April	37	36	38	40	43	43	44	45	46	46	48	48	48	50	50	40	42	44	44	48	48	50	50	49	50	50	50	50	53	53	-	46
May	53	50	48	48	50	54	54	54	54	55	56	59	60	60	60	60	60	54	54	52	54	54	54	52	52	54	53	54	58	60	60	55
June	58	56	56	55	51	50	52	52	52	52	52	52	54	54	56	56	56	54	53	54	56	53	55	57	55	60	57	57	56	57	-	55
July	59	60	60	60	60	60	60	60	58	60	60	60	60	60	62	64	65	66	66	65	67	65	65	66	66	65	63	64	66	67	65	62
August	65	66	67	62	63	64	64	66	67	65	66	66	67	66	63	62	62	64	64	64	60	65	64	64	64	63	63	63	62	60	60	63
September	62	59	58	58	60	59	61	63	63	62	59	60	59	60	59	59	56	50	52	52	53	55	53	53	52	53	56	53	53	51	-	56
October	48	46	45	46	50	48	43	48	47	48	47	48	48	50	50	50	51	50	50	49	48	48	49	48	48	48	48	49	49	44	48	48
November	46	46	44	42	42	42	42	42	42	42	42	40	39	37	36	36	35	35	36	35	35	34	34	34	34	36	36	34	36	35	-	38
December	35	34	34	35	33	35	35	36	36	34	33	33	34	33	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
Water temperatures (°F), calendar year 1945																																
January	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	40	38	39	39	41	43	41	42	43	44	43	44	44	45	36
April	42	41	38	38	39	40	42	42	44	46	46	45	42	42	42	41	41	39	43	46	50	50	50	50	50	48	50	50	48	50	-	43
May	50	50	53	54	57	62	54	52	52	50	51	52	52	49	47	46	50	53	54	52	51	50	52	54	56	56	56	54	54	56	58	52
June	54	55	56	54	55	52	51	50	50	44	51	52	53	52	52	51	52	54	57	58	60	62	60	58	55	56	56	54	52	51	-	54
July	52	56	56	58	58	58	58	60	60	60	60	59	60	62	62	61	60	60	60	63	63	64	64	66	66	66	67	67	67	67	66	61
August	65	65	67	66	66	65	66	65	65	65	66	67	66	64	66	66	64	65	66	64	58	57	60	62	65	65	63	62	61	62	63	64
September	63	64	63	65	63	65	62	59	59	54	57	54	55	56	56	60	52	52	51	50	50	50	50	50	49	49	47	46	46	48	-	56
October	48	49	51	51	51	51	52	51	51	51	51	52	51	51	51	52	51	50	48	48	46	46	43	44	42	42	42	42	43	43	44	48
November	46	50	48	44	46	44	40	38	40	36	35	34	34	35	36	37	37	37	36	36	36	34	34	34	38	36	36	36	36	36	-	38
December	36	40	33	34	34	35	35	34	33	33	33	33	33	33	32	32	32	33	33	32	32	32	32	32	34	32	32	33	33	34	33	33

180. Yellowstone River at Billings Water Works, at Billings, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1946																																
January	33	34	34	34	34	33	33	33	33	33	33	32	32	32	32	32	32	33	33	34	33	34	34	36	36	34	34	34	34	33	33	33
February	33	33	33	33	34	34	35	34	34	32	35	32	35	34	34	34	34	34	35	34	34	36	34	34	34	34	34	36	-	-	-	34
March	34	34	34	34	34	35	35	36	38	38	42	43	43	42	40	43	42	42	44	48	42	42	42	43	43	44	47	49	50	50	48	41
April	48	46	46	46	48	50	50	48	50	50	48	51	52	53	54	55	58	58	58	58	57	53	52	54	56	58	56	54	54	54	-	52
May	49	49	52	53	53	52	49	52	51	46	47	60	53	52	52	55	56	58	55	51	53	54	54	52	53	56	59	59	55	51	51	53
June	52	51	57	60	62	60	56	55	56	59	58	54	56	58	59	59	59	56	55	58	60	60	58	60	58	58	58	59	61	58	-	58
July	62	65	64	64	64	63	64	65	64	60	63	66	68	68	69	68	69	69	68	68	66	70	66	66	67	71	70	70	70	70	71	67
August	68	69	69	68	70	69	66	64	63	64	66	68	68	66	64	66	65	62	64	66	68	67	68	70	70	68	64	59	59	59	62	66
September	60	61	63	64	63	61	59	56	55	54	59	62	62	62	62	63	59	56	55	55	52	54	50	52	55	58	57	56	54	54	-	58
October	56	57	52	51	52	47	48	46	48	46	45	46	43	49	46	44	44	46	43	45	48	48	50	47	48	44	42	44	43	42	42	47
November	42	40	40	38	39	40	43	40	40	38	39	39	39	39	39	39	40	40	38	37	37	36	36	36	36	37	36	36	38	40	-	39
December	36	38	38	38	40	40	40	40	40	39	40	37	36	36	36	36	36	36	36	36	36	36	36	36	36	38	36	34	34	36	36	37
Water temperatures (°F), calendar year 1947																																
January	36	36	37	36	36	37	36	36	36	36	36	36	37	36	34	37	36	37	37	36	36	37	36	36	36	34	37	37	36	37	36	36
February	36	35	36	36	36	36	36	36	34	36	36	36	36	36	36	36	36	36	36	36	37	37	34	36	36	36	36	36	-	-	-	36
March	36	35	36	36	36	36	36	36	36	36	36	36	36	36	36	37	35	35	38	37	39	44	42	43	41	40	41	44	46	48	46	39
April	46	48	47	42	43	43	44	46	47	48	44	46	46	50	50	48	48	52	48	51	49	47	46	50	48	49	54	56	56	55	-	48
May	53	53	56	56	58	57	56	54	55	56	56	50	52	52	54	55	56	58	55	54	56	54	54	54	56	56	57	53	53	53	56	55
June	56	57	57	56	55	56	55	--	59	57	52	52	56	57	58	58	58	56	57	58	56	53	53	56	58	59	58	54	56	53	-	56
July	56	59	61	63	63	64	66	63	62	64	64	63	62	65	66	66	65	66	67	66	67	68	68	67	67	67	68	69	70	68	67	65
August	68	68	68	68	67	68	68	68	71	63	66	66	64	64	64	65	66	69	69	68	70	70	69	64	64	64	65	67	67	69	69	67
September	68	68	68	68	67	67	64	66	61	60	56	58	58	55	54	54	54	52	52	52	52	55	58	58	58	58	59	59	57	54	-	59
October	54	56	57	56	54	54	53	50	50	51	52	48	50	50	50	51	51	50	50	50	53	50	45	44	46	46	46	46	46	46	46	50
November	46	46	45	42	41	40	38	38	37	37	36	36	34	34	35	35	34	34	34	34	34	34	34	34	34	36	36	36	35	35	-	37
December	36	35	33	33	32	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	36	32	32	32	32
Water temperatures (°F), calendar year 1948																																
January	34	33	32	32	32	32	32	32	32	32	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	34	34	35	35	35	34	33
February	33	36	34	35	34	34	33	33	33	33	33	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	-	-	33
March	33	33	33	33	33	34	34	33	33	33	33	33	34	34	34	34	34	34	34	34	35	34	36	39	40	37	38	40	41	43	40	35
April	39	41	44	44	45	44	43	43	42	44	44	43	44	46	49	52	53	54	51	50	52	53	53	52	53	49	48	49	52	54	-	48
May	52	54	48	50	50	48	52	55	55	50	47	48	53	54	53	54	57	58	62	60	56	56	53	54	55	56	55	52	52	54	52	53
June	55	56	56	54	53	53	57	58	58	58	55	55	56	58	58	59	57	56	56	54	56	56	57	57	56	57	58	60	61	63	-	57
July	64	64	63	63	64	65	66	66	67	67	67	64	66	64	64	64	64	64	65	65	63	64	67	69	68	64	66	66	63	63	64	65
August	64	66	64	63	67	66	65	67	65	65	65	65	66	66	65	68	68	68	68	65	64	66	64	64	64	64	65	65	68	67	65	65
September	65	64	64	65	62	61	60	58	59	59	60	62	60	61	61	60	61	61	62	58	58	58	59	57	53	53	55	55	56	56	-	59
October	55	54	55	57	56	51	48	50	50	51	51	52	52	53	53	50	48	46	45	49	50	47	48	48	50	48	46	46	45	43	44	50
November	45	45	45	44	42	39	39	37	36	37	37	37	38	39	40	40	39	38	35	36	36	37	36	37	37	36	35	34	35	35	-	38
December	34	34	35	35	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34

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Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1949																																
January.....	34	34	34	33	34	34	33	34	32	33	34	34	34	34	33	33	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
February.....	33	33	33	33	33	33	33	33	33	33	32	33	33	33	33	33	33	33	32	32	33	33	33	33	32	32	33	32	-	-	-	33
March.....	32	32	33	33	33	32	33	33	33	32	32	32	32	32	32	32	32	32	32	33	32	32	32	33	33	33	33	33	33	35	38	33
April.....	40	42	44	46	47	47	49	50	50	50	50	53	50	54	46	48	49	51	54	56	51	51	51	54	54	54	55	56	56	56	-	50
May.....	50	51	54	56	51	48	51	56	57	59	62	60	60	57	57	56	55	50	47	50	53	53	50	50	53	56	58	57	58	56	56	54
June.....	53	52	52	52	52	58	60	60	58	60	60	61	57	57	57	57	57	52	54	56	58	60	58	60	60	61	56	57	59	59	-	57
July.....	59	60	60	61	64	64	63	63	64	62	65	64	64	65	66	67	66	64	65	64	63	63	64	65	66	65	66	63	63	65	65	63
August.....	67	67	68	68	67	67	66	68	66	66	66	66	62	65	64	64	64	63	64	63	66	66	66	64	63	63	62	62	64	63	62	65
September....	62	62	61	59	59	56	55	57	60	61	46	51	51	53	54	57	53	52	53	55	54	55	56	58	58	57	56	55	55	55	-	56
October.....	56	57	53	51	52	50	48	44	43	44	43	45	45	45	45	48	45	41	39	38	35	36	36	41	42	43	45	46	46	44	43	45
November.....	44	44	44	44	44	43	43	43	44	44	43	42	44	42	42	40	40	40	41	40	38	38	38	38	41	42	42	43	40	39	-	41
December.....	36	37	37	35	34	34	34	33	33	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34
Water temperatures (°F), calendar year 1950																																
January.....	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	33	33	33	33	33	33	33	33	33	33
February.....	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	33	34	-	-	-	33
March.....	33	33	33	33	34	33	33	33	33	33	33	33	33	33	33	33	33	33	36	33	33	34	33	34	33	34	34	34	37	38	42	34
April.....	42	44	40	39	40	44	46	43	43	44	44	46	50	52	52	52	52	48	46	47	49	50	50	44	42	44	44	43	36	42	-	45
May.....	42	43	43	42	44	48	48	44	44	47	50	54	55	58	57	56	57	57	50	47	50	54	57	54	48	50	54	57	52	54	53	50
June.....	53	51	51	52	57	58	54	46	46	48	57	58	56	56	54	55	53	53	52	54	55	55	54	54	52	51	54	56	57	59	-	54
July.....	60	60	60	60	58	59	60	60	61	61	61	59	59	61	60	60	60	59	60	61	61	62	62	62	63	64	65	65	62	62	59	61
August.....	58	60	62	62	64	63	63	62	63	63	63	62	62	62	62	65	63	63	60	61	62	62	60	61	62	61	61	64	63	64	64	62
September....	65	65	68	66	67	67	67	63	61	58	55	55	51	51	50	50	52	54	56	57	55	56	55	55	56	57	53	52	47	45	-	57
October.....	43	40	42	42	44	48	46	48	50	48	50	52	54	54	55	51	52	51	50	50	49	48	48	48	48	50	49	48	47	48	49	48
November.....	47	45	42	42	44	44	43	39	35	35	35	35	34	34	34	34	34	36	35	35	34	35	34	34	34	35	38	40	39	37	-	37
December.....	36	34	34	34	34	34	33	33	33	33	33	33	33	33	33	33	34	33	34	35	36	36	36	38	38	37	35	34	34	34	36	34
Water temperatures (°F), calendar year 1951																																
January.....	35	35	34	34	33	34	35	34	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
February.....	34	34	33	33	34	33	32	32	34	34	35	34	34	34	34	34	34	34	34	34	34	35	33	33	34	34	34	34	-	-	-	34
March.....	33	34	34	34	34	34	34	34	33	33	33	34	33	33	33	33	32	34	34	34	33	33	33	34	35	34	34	34	36	39	40	34
April.....	42	42	42	45	47	47	45	45	49	44	43	43	46	47	46	44	46	47	46	43	40	42	44	44	43	47	52	54	56	54	-	46
May.....	52	48	50	52	55	54	55	56	55	56	57	60	59	58	57	57	59	61	61	60	58	58	59	59	59	56	55	56	54	53	50	56
June.....	46	45	45	50	53	52	55	54	55	56	59	60	60	60	60	60	60	57	57	56	56	55	54	57	56	57	56	56	56	56	-	55
July.....	57	58	58	58	62	62	63	64	59	57	54	54	58	61	63	64	66	66	68	66	64	64	64	66	64	64	65	65	65	67	68	62
August.....	68	66	68	68	67	66	65	64	62	62	62	63	63	64	62	63	65	65	66	65	62	64	65	65	61	60	60	60	58	60	61	63
September....	61	61	60	55	56	58	60	60	60	59	60	54	54	54	52	54	56	58	57	59	53	54	52	52	52	53	50	47	50	52	-	55
October.....	54	53	54	53	53	53	54	54	54	54	54	53	52	52	52	48	45	44	44	43	44	43	42	42	42	40	40	41	42	40	39	48
November.....	36	36	36	34	37	37	37	38	40	40	40	40	40	39	38	37	36	36	35	35	35	35	35	35	36	34	36	36	37	37	-	37
December.....	38	39	38	37	37	36	34	34	35	33	34	34	34	33	33	33	33	33	33	33	33	33	34	33	33	33	33	33	33	34	33	34

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Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1952																																
January	33	33	34	33	34	34	33	34	33	34	33	33	33	33	33	33	34	33	33	34	33	33	33	33	32	33	33	33	34	34	34	33
February	33	33	34	33	34	33	35	35	35	35	33	34	33	33	33	33	33	33	33	33	33	33	33	33	32	32	33	33	32	-	-	33
March	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	34	34	33	33	33	33	34	34	34	35	36	40	40	42	41	34
April	40	43	45	43	45	46	49	46	43	44	48	52	48	50	52	51	50	53	55	56	52	49	50	53	57	57	57	60	57	52	-	50
May	54	55	56	57	54	53	54	53	51	50	54	55	58	56	55	52	48	52	52	54	54	52	51	53	57	56	54	54	56	55	54	54
June	55	55	56	57	58	58	58	56	56	58	56	58	58	56	59	56	56	56	58	58	60	58	58	58	56	54	55	56	60	62	-	57
July	61	60	60	61	65	67	59	60	63	65	65	62	60	60	61	64	65	64	64	64	62	63	61	64	65	66	65	63	65	66	67	61
August	68	68	67	66	64	65	67	64	64	66	61	60	63	66	64	64	64	64	65	64	65	65	67	66	68	66	64	63	63	62	63	65
September	59	59	60	62	63	63	65	64	63	64	65	64	62	56	55	56	57	58	59	57	59	57	56	57	57	57	58	56	55	56	-	59
October	56	54	54	53	51	45	47	48	50	50	52	52	51	47	45	47	46	46	45	47	48	47	48	48	48	48	46	43	44	45	45	48
November	45	43	40	40	40	40	40	41	41	37	37	36	37	38	38	40	35	38	38	36	37	35	35	34	34	34	34	34	33	34	-	37
December	33	33	33	33	34	33	36	34	34	33	33	34	33	36	34	33	33	33	33	33	34	33	33	33	33	33	33	33	34	33	33	33
Water temperatures (°F), calendar year 1953																																
January	33	33	34	34	34	33	33	34	34	34	33	34	34	33	33	34	34	34	34	34	34	34	34	34	35	34	34	33	34	35	36	34
February	38	39	39	40	39	38	36	39	37	34	33	33	33	33	34	34	33	33	33	33	32	33	33	33	33	34	35	35	-	-	-	35
March	35	34	33	33	33	33	33	36	40	42	45	44	44	38	42	40	43	38	40	42	39	40	38	39	42	44	44	47	48	44	47	40
April	46	42	43	45	45	46	44	38	37	40	40	44	42	43	41	43	43	39	43	45	49	52	54	50	46	48	53	53	52	50	-	45
May	50	49	49	47	53	57	59	57	54	49	45	42	41	42	45	49	54	56	58	55	53	50	50	52	51	54	58	59	57	54	54	51
June	56	58	56	52	50	51	53	53	55	58	60	62	60	59	58	55	55	58	55	52	55	55	57	58	54	53	54	58	58	60	-	56
July	63	62	61	60	61	60	61	62	62	64	63	65	64	66	67	64	64	66	67	67	64	64	65	66	66	66	66	68	68	68	69	64
August	68	67	63	64	63	64	65	66	66	65	62	63	60	63	65	65	66	68	68	69	69	67	63	66	62	63	63	63	61	63	65	65
September	66	65	58	56	57	59	61	62	63	63	63	63	63	63	61	62	61	60	58	60	55	56	58	58	57	55	55	55	56	54	-	59
October	54	55	51	51	50	50	51	53	53	54	54	54	52	54	53	54	53	46	50	50	50	46	44	43	45	42	43	45	48	48	48	50
November	47	47	44	43	42	43	41	40	41	40	40	41	43	--	42	43	42	42	39	36	35	36	35	37	37	37	36	36	37	37	-	40
December	37	38	37	36	35	35	34	33	33	33	33	33	33	33	33	33	33	33	33	33	34	34	33	33	33	33	33	33	33	33	33	34
Water temperatures (°F), calendar year 1954																																
January	33	33	33	33	33	33	34	34	34	35	33	32	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33
February	32	32	32	32	32	32	33	33	33	33	32	32	33	34	32	33	33	33	33	33	33	34	34	35	36	37	37	38	-	-	-	33
March	36	34	33	33	34	34	34	34	35	38	40	41	38	37	37	38	38	38	40	40	40	39	40	40	39	39	40	37	36	36	36	37
April	35	35	36	41	41	46	47	48	48	47	47	48	48	52	50	52	52	52	51	49	48	48	50	51	53	54	54	52	46	43	-	47
May	39	40	41	43	46	51	54	55	55	56	58	59	60	59	58	57	58	58	60	60	60	56	56	53	54	55	55	53	50	50	46	53
June	54	54	52	54	58	58	56	54	54	56	56	57	59	59	59	60	57	56	56	58	61	63	64	63	60	60	60	60	58	56	-	58
July	59	60	62	64	64	66	65	65	65	65	67	68	69	69	69	68	68	68	70	70	70	66	64	66	69	69	68	68	68	67	67	67
August	64	68	68	69	68	67	65	66	66	68	68	68	68	67	67	67	67	66	64	64	64	63	64	65	65	66	64	63	64	65	67	66
September	67	66	65	63	62	61	61	61	61	61	62	64	64	63	62	61	60	58	57	55	55	56	58	58	58	60	60	59	55	51	-	60
October	47	48	49	49	48	47	48	50	53	53	52	50	48	44	44	45	48	49	48	49	49	49	49	44	44	43	40	41	40	40	41	47
November	40	40	40	40	41	42	42	41	40	41	42	41	42	43	43	43	44	42	42	42	42	42	41	41	41	41	40	39	37	35	-	41
December	33	33	33	34	34	33	33	32	33	33	33	33	33	33	33	33	33	34	34	35	33	33	33	34	33	35	33	33	33	33	33	33

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Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1955																																
January	34	34	33	33	33	33	33	33	34	32	33	32	33	34	33	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
February	34	33	33	33	33	33	33	33	33	32	32	33	33	34	34	34	33	33	33	33	33	33	32	33	32	33	34	32	-	-	-	33
March	33	32	33	32	32	33	33	33	33	33	33	33	33	33	33	33	33	33	34	33	33	33	33	33	33	33	34	33	33	33	33	33
April	34	34	34	33	33	34	33	33	34	38	40	41	44	45	46	46	47	46	48	46	47	48	48	48	49	48	48	48	48	51	-	42
May	51	56	54	51	54	56	57	57	56	56	56	57	57	56	54	52	51	53	56	60	62	62	60	58	55	53	54	52	53	55	58	56
June	57	55	55	54	56	54	56	58	59	58	59	58	59	60	60	58	58	58	57	58	61	61	62	63	61	60	60	60	62	60	-	58
July	59	57	58	59	60	65	64	62	62	63	63	62	62	66	69	70	72	73	73	74	72	72	70	67	69	69	69	69	69	69	69	66
August	72	71	72	70	69	70	70	70	70	69	70	71	72	68	65	67	68	70	71	71	70	70	69	69	68	68	69	68	66	66	66	69
September	68	68	68	68	68	67	67	67	62	60	57	59	62	63	63	61	60	60	60	60	59	56	52	50	51	47	48	51	52	50	-	59
October	50	51	52	54	53	51	49	49	49	51	54	52	50	50	51	51	52	52	53	53	53	52	46	44	44	45	46	46	44	43	42	49
November	39	37	34	36	39	37	38	38	37	37	38	35	34	33	32	34	34	34	33	32	33	33	33	33	33	32	33	32	33	33	-	35
December	33	33	34	33	33	34	33	33	34	34	33	33	32	32	33	33	33	33	33	33	34	33	34	33	33	33	33	32	33	33	33	33
Water temperatures (°F), calendar year 1956																																
January	33	34	32	33	33	32	33	33	33	34	33	34	34	34	32	34	33	33	33	34	34	33	34	33	33	33	34	33	33	32	33	33
February	33	33	33	33	33	32	33	34	34	33	34	33	33	33	33	32	33	32	33	33	33	33	33	34	33	33	34	34	34	-	-	33
March	34	32	32	33	32	33	32	32	33	32	32	32	32	32	32	33	32	33	34	33	33	33	33	33	32	33	38	37	36	37	41	33
April	41	42	41	42	44	44	43	42	43	44	47	44	46	49	53	50	48	48	48	50	53	50	46	46	43	46	43	42	43	44	-	46
May	45	45	42	41	42	43	48	50	52	52	52	50	52	48	52	54	58	60	59	59	56	53	53	56	56	52	54	54	49	50	52	51
June	53	56	56	55	55	54	53	53	56	57	56	56	56	58	57	58	55	56	57	60	57	56	55	59	58	59	60	61	61	60	-	57
July	59	59	58	58	58	60	60	60	62	63	64	62	64	62	63	64	64	64	64	65	65	68	68	69	68	68	67	66	69	67	68	64
August	66	66	66	62	62	64	63	62	64	62	63	64	64	65	68	66	68	65	60	60	61	63	65	66	64	66	63	61	60	57	54	63
September	53	58	58	55	54	54	54	60	60	62	58	60	60	58	58	58	57	58	59	59	62	56	53	52	52	54	56	54	54	--	-	57
October	51	52	52	53	54	53	52	52	48	48	49	50	52	49	48	47	48	48	48	46	47	44	42	42	40	41	40	40	38	36	38	47
November	36	33	32	33	34	36	37	36	37	40	42	40	41	38	34	32	35	34	31	32	32	33	33	34	34	33	33	34	34	35	-	35
December	35	35	34	32	32	30	32	32	32	32	31	32	32	32	33	33	31	32	31	32	32	33	33	34	34	32	32	32	32	33	32	32
Water temperatures (°F), calendar year 1957																																
January	32	31	31	32	32	32	32	30	30	30	30	31	33	32	31	31	32	31	33	32	31	31	31	31	31	31	31	32	30	31	31	31
February	31	31	32	31	30	31	31	30	31	32	31	34	31	31	32	32	33	31	31	31	31	31	31	31	31	31	31	31	-	-	-	31
March	31	34	34	32	34	32	31	31	33	33	32	32	31	31	31	31	31	32	32	34	41	39	39	39	38	40	40	39	42	44	46	35
April	49	42	44	44	44	43	44	44	43	45	39	39	40	41	44	46	47	46	45	43	43	52	51	45	45	46	47	49	54	56	-	45
May	56	58	58	60	58	56	57	56	50	58	52	52	48	49	48	49	50	51	55	50	46	44	47	49	52	54	56	58	57	58	54	53
June	53	55	54	54	54	54	51	55	54	52	52	54	52	52	52	51	48	52	55	57	53	52	54	56	56	56	54	56	--	60	-	54
July	58	58	58	56	57	60	61	60	61	62	64	65	66	66	64	65	66	63	65	64	63	64	66	65	66	66	66	66	66	66	66	63
August	66	67	67	66	68	69	68	67	67	70	70	66	66	66	66	66	66	66	66	64	66	67	63	64	63	61	60	61	60	62	62	65
September	59	58	60	59	61	62	61	62	60	56	56	58	56	54	56	56	57	53	47	44	48	49	51	53	54	55	56	57	57	58	-	56
October	60	58	57	52	50	48	44	41	41	43	46	48	50	52	52	48	47	47	48	48	46	46	40	38	37	41	41	43	43	43	45	47
November	44	40	39	36	34	34	37	36	36	36	37	36	37	37	36	38	38	33	33	32	32	31	32	33	35	36	35	35	32	31	-	35
December	31	31	31	32	33	32	32	34	35	36	32	34	32	34	32	32	33	33	32	32	33	34	33	33	34	34	34	34	33	32	32	33

YELLOWSTONE RIVER BASIN

180. Yellowstone River at Billings Water Works, at Billings, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1958																																
January	34	32	32	33	33	32	32	32	32	32	33	33	32	32	32	33	32	33	32	32	32	32	32	31	32	32	32	32	32	32	32	32
February	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	34	33	38	39	36	35	-	-	-	33
March	36	36	36	37	36	37	38	39	--	36	36	36	36	32	33	33	33	35	38	40	42	43	41	42	42	44	42	42	44	46	48	39
April	44	45	44	46	45	46	43	46	44	44	46	47	50	53	51	52	52	54	53	52	46	47	41	38	42	45	46	41	44	47	-	46
May	50	52	55	57	56	57	56	56	57	61	60	60	57	53	53	56	59	58	57	58	60	58	57	57	57	57	57	57	57	59	57	57
June	56	57	57	54	54	56	59	60	58	57	55	55	54	54	55	56	60	62	62	59	56	56	59	62	60	58	62	65	66	63	-	58
July	62	62	62	60	61	62	62	61	63	65	66	68	68	66	63	64	66	68	68	67	68	70	70	68	68	70	67	67	68	67	68	66
August	68	72	72	72	70	69	70	71	73	70	71	72	71	72	72	72	72	70	69	69	68	68	68	66	65	68	68	68	66	62	61	69
September	63	63	62	61	61	62	64	63	65	66	65	66	65	61	58	55	57	56	56	57	55	55	56	54	51	50	53	52	53	51	-	59
October	50	48	49	52	52	54	--	51	48	46	48	49	51	52	52	52	49	45	45	45	43	43	44	44	44	44	44	42	41	40	40	47
November	40	41	40	43	43	41	40	40	40	41	41	42	40	39	39	36	33	32	33	33	33	34	36	37	37	34	35	34	34	34	-	38
December	33	34	35	36	34	34	--	31	31	31	32	31	32	31	31	32	32	32	30	32	32	32	31	31	31	31	32	32	30	32	31	32
Water temperatures (°F), calendar year 1959																																
January	33	30	32	31	30	31	31	30	32	32	32	31	32	32	31	32	33	34	32	31	30	30	31	31	31	30	30	31	30	31	31	31
February	31	30	31	30	30	31	30	31	30	30	31	32	30	31	32	32	30	30	30	30	30	30	31	32	32	32	32	32	-	-	-	31
March	32	32	33	33	32	33	33	34	33	33	33	33	33	33	33	34	36	38	36	38	40	42	42	43	42	42	45	45	44	42	43	37
April	44	47	44	47	48	50	44	43	41	42	42	42	46	48	50	49	44	45	42	40	42	46	49	49	47	43	47	49	50	50	-	46
May	53	54	53	52	50	49	50	52	54	54	52	51	53	56	56	58	52	53	51	49	47	50	50	55	56	58	56	52	51	53	53	53
June	56	59	62	64	62	62	61	56	54	55	54	54	57	58	56	58	58	60	60	60	62	60	60	60	62	60	59	58	55	54	-	59
July	57	60	59	58	59	61	63	60	59	61	63	64	66	67	68	68	68	69	70	68	69	70	71	72	72	72	71	72	69	66	68	65
August	71	71	70	70	70	69	69	72	72	70	70	68	68	66	62	64	67	69	67	66	68	69	68	67	67	67	66	66	--	66	67	68
September	66	62	60	62	62	64	65	66	62	60	60	62	64	65	64	61	57	54	57	58	58	56	55	56	55	55	53	51	48	48	-	59
October	47	47	48	50	52	53	50	47	46	46	46	44	46	47	48	49	48	48	48	48	46	46	47	49	50	47	46	45	46	42	42	47
November	43	42	44	40	34	35	36	--	35	38	38	34	34	34	34	33	34	34	34	34	35	35	35	35	34	34	33	35	36	34	-	36
December	34	34	36	34	34	35	34	34	34	34	34	34	35	34	34	34	34	34	34	35	34	32	32	32	32	32	33	33	32	32	32	34
Water temperatures (°F), calendar year 1960																																
January	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February	32	32	32	32	32	32	32	32	32	32	32	33	34	34	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	32
March	32	32	32	32	32	32	32	32	32	32	32	33	33	32	32	33	33	33	34	34	34	35	36	38	44	46	50	50	47	46	47	36
April	46	47	47	49	52	54	54	54	56	56	53	52	49	48	49	48	48	47	50	50	50	52	52	47	43	43	44	43	41	43	-	49
May	47	52	53	51	49	50	51	50	56	58	61	64	63	57	56	55	54	54	53	51	54	57	57	55	54	56	60	--	60	62	63	55
June	61	58	60	60	--	54	59	58	57	56	59	60	59	60	60	58	59	60	60	58	58	56	55	58	60	--	64	63	64	64	-	59
July	66	65	66	67	66	66	68	70	71	70	68	68	69	70	72	72	72	72	72	72	72	72	72	72	70	70	71	71	72	--	--	70
August	75	73	72	72	72	72	72	69	69	67	68	70	70	70	70	70	65	64	66	--	--	70	66	64	60	60	--	61	--	62	64	68
September	65	64	67	66	68	67	65	62	60	60	60	60	62	61	62	63	--	60	60	61	60	57	54	54	56	56	57	58	58	56	-	61
October	56	55	55	55	56	56	56	56	55	53	50	50	50	48	47	47	48	49	46	48	48	50	51	50	48	48	49	46	46	42	42	50
November	42	41	42	42	43	40	40	40	38	37	37	39	41	41	40	38	38	39	38	41	38	38	36	38	40	38	38	33	33	34	-	39
December	34	34	35	35	34	33	34	38	36	--	36	35	35	35	34	35	--	--	35	34	34	33	34	34	34	34	34	34	34	34	34	34

180. Yellowstone River at Billings Water Works, at Billings, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1961																																
January	34	34	34	34	34	34	--	35	36	34	34	34	34	34	34	35	34	35	35	34	34	34	34	34	34	34	34	34	34	32	34	34
February	34	34	34	34	34	34	35	34	35	35	--	--	--	40	40	39	37	36	36	35	36	38	40	38	38	38	38	38	-	-	-	36
March	36	37	38	37	38	36	36	37	38	40	41	41	42	42	44	47	48	47	46	48	46	46	46	48	48	47	48	44	44	43	46	43
April	47	49	50	51	48	46	45	46	48	47	48	47	49	48	45	47	48	48	51	52	52	52	50	46	44	44	48	48	53	55	-	48
May	53	56	56	55	54	56	54	52	55	58	59	59	56	58	58	55	53	52	52	48	--	56	60	62	62	58	60	59	59	58	53	56
June	53	53	57	56	56	56	56	57	56	57	57	57	56	55	57	59	60	61	66	64	65	64	64	66	68	68	69	69	69	69	-	61
July	70	68	68	69	68	69	69	69	69	72	69	69	68	68	68	70	70	70	70	70	70	70	71	72	72	72	72	72	74	73	74	70
August	72	74	74	75	75	76	76	73	70	66	67	68	70	70	70	73	69	70	--	70	70	70	71	72	72	--	--	70	69	68	69	71
September	68	66	62	60	61	64	63	61	60	--	58	55	55	53	53	--	--	63	60	56	54	52	51	50	50	50	50	51	51	51	-	57
October	49	50	50	53	54	54	53	49	47	47	47	48	48	--	54	55	54	52	48	50	50	46	44	43	42	41	41	41	40	39	38	48
November	38	38	37	37	36	36	36	36	38	40	42	42	40	37	37	36	35	34	34	34	34	34	34	34	34	34	34	36	36	36	-	36
December	35	35	36	36	36	34	34	34	--	--	34	34	34	34	34	34	33	34	34	34	34	34	34	--	--	33	32	33	33	34	34	34
Water temperatures (°F), calendar year 1962																																
January	34	33	34	33	34	--	--	32	32	32	32	33	33	33	32	33	33	32	32	32	30	30	30	30	31	31	31	32	32	31	32	32
February	31	31	--	--	31	31	31	31	31	31	32	31	31	31	31	31	30	30	30	30	30	30	30	30	30	31	30	30	-	-	-	31
March	30	30	30	30	30	30	31	31	31	31	31	30	30	31	31	31	31	32	33	33	--	34	34	34	34	--	--	40	40	38	38	32
April	39	40	43	45	48	45	45	42	41	45	43	44	47	56	57	4	54	55	54	54	54	54	50	54	56	54	50	50	48	46	-	49
May	47	49	52	55	55	54	52	52	53	55	55	55	52	50	49	49	51	53	57	58	61	53	52	53	53	53	50	49	50	53	56	53
June	58	57	57	56	57	49	48	51	56	56	60	58	57	57	57	56	54	52	56	57	56	56	57	--	59	58	60	59	58	58	-	56
July	60	60	60	59	60	60	60	62	63	63	63	63	63	62	60	61	62	62	62	62	62	62	65	66	66	66	65	64	64	64	65	62
August	65	62	63	62	62	62	62	64	64	64	62	61	65	68	66	65	65	--	--	63	64	65	59	58	63	63	62	59	57	56	56	62
September	--	--	--	53	54	58	58	53	53	52	53	54	53	54	55	58	58	57	57	57	58	58	56	58	57	57	56	56	54	52	-	56
October	50	50	51	52	53	53	51	51	51	53	52	52	52	52	51	47	47	46	49	49	50	49	47	48	44	46	46	48	48	48	48	50
November	48	48	46	45	45	--	42	41	41	--	41	42	41	40	42	40	39	38	36	37	38	--	35	35	34	36	38	38	38	36	-	40
December	36	34	35	35	32	33	34	37	37	35	34	34	34	34	35	36	36	37	37	38	36	35	35	33	33	32	31	32	32	32	31	34
Water temperatures (°F), calendar year 1963																																
January	32	32	31	31	32	31	31	32	32	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
February	31	31	--	30	31	31	31	31	31	31	31	31	31	31	31	31	31	32	32	32	31	32	32	33	35	36	37	36	-	-	-	32
March	38	38	36	34	34	34	34	36	37	38	40	37	34	34	34	35	35	37	39	40	42	44	48	48	44	44	44	46	43	44	44	39
April	44	43	40	42	44	47	46	46	46	44	43	45	46	51	52	48	46	46	43	45	41	40	41	44	46	49	53	50	46	50	-	46
May	53	50	50	50	51	53	56	54	54	51	53	51	52	52	53	52	54	54	55	52	52	52	52	54	54	53	53	52	53	54	54	53
June	53	52	53	50	50	52	53	--	--	52	50	54	55	56	54	53	55	53	56	58	55	55	56	54	56	56	58	59	60	59	-	55
July	57	60	61	62	62	62	64	61	61	62	61	61	61	62	61	61	61	61	61	63	64	67	66	66	67	66	61	63	66	65	65	63
August	65	64	64	67	67	68	68	70	69	69	70	69	67	68	67	67	66	66	66	66	65	65	63	64	64	65	65	64	64	62	62	66
September	63	63	63	63	63	64	64	66	65	65	64	64	64	63	60	56	56	56	58	58	60	60	60	58	58	58	58	58	59	58	-	61
October	58	58	57	57	57	56	54	54	54	54	54	54	54	53	53	52	52	52	52	51	50	50	51	48	47	47	43	40	42	43	42	51
November	41	41	40	41	43	42	41	41	41	42	40	40	39	39	41	42	39	38	37	35	34	34	34	34	33	35	37	36	35	34	-	38
December	33	32	32	32	33	34	35	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32

YELLOWSTONE RIVER BASIN

180. Yellowstone River at Billings Water Works, at Billings, Mont.

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1964																																
January.....	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	37	37	34	34	36	32	32	32	32	32	32	32	37	41	33
April.....	44	45	40	38	44	43	39	41	44	47	48	46	42	43	44	48	42	43	45	47	50	48	50	51	48	44	43	46	50	53	-	45
May.....	55	55	49	45	45	48	50	50	49	53	51	50	53	55	58	58	60	58	57	57	54	54	52	51	53	52	52	51	50	47	49	52
June.....	52	54	56	53	55	55	53	50	49	49	49	50	53	55	57	56	54	50	52	51	52	53	54	57	58	58	56	56	55	56	-	54
July.....	57	58	58	59	60	59	59	60	60	60	62	63	64	63	62	62	63	64	63	64	66	67	66	64	64	65	66	65	65	67	66	63
August.....	67	65	65	66	67	64	64	65	66	67	64	63	64	65	64	66	66	66	66	60	54	56	55	59	58	60	58	58	55	54	56	62
September....	58	59	56	55	56	56	55	56	58	57	52	53	54	55	57	58	57	58	56	55	55	55	53	53	54	51	48	50	50	52	-	55
October.....	52	48	50	48	47	47	49	50	51	52	51	51	50	50	51	51	46	45	44	44	46	47	46	45	44	44	43	44	44	46	47	48
November.....	47	46	44	42	42	42	43	42	40	40	40	38	38	36	33	33	33	32	33	33	34	34	34	35	36	33	32	32	32	31	-	37
December.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32
Water temperatures (°F), calendar year 1965																																
January.....	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
April.....	33	33	33	33	39	43	44	46	46	46	44	40	43	43	46	45	42	43	46	48	48	50	48	45	48	48	46	48	52	52	-	44
May.....	54	52	48	48	50	48	43	42	43	46	45	53	55	56	53	54	54	50	49	52	51	48	47	47	48	47	47	49	54	56	55	50
June.....	52	51	55	54	51	53	53	48	52	52	53	53	53	52	49	50	51	52	52	53	54	53	54	53	53	53	52	52	53	53	-	52
July.....	54	55	56	56	55	55	58	57	58	58	58	59	58	58	59	62	62	62	62	62	63	63	63	63	64	63	63	64	64	63	64	60
August.....	65	65	66	65	64	64	63	64	66	66	66	67	67	66	64	64	64	64	64	64	61	62	61	61	60	60	59	60	59	57	56	63
September....	57	59	60	56	53	53	52	53	55	54	53	52	51	53	54	48	44	43	44	45	46	47	46	46	47	47	46	44	42	45	-	50
October.....	46	47	48	50	51	50	50	51	51	51	49	48	48	47	48	48	46	46	46	45	45	46	47	47	47	47	46	46	45	47	46	48
November.....	46	46	45	44	44	45	44	43	42	42	42	40	38	38	40	40	39	38	38	38	38	38	37	35	34	32	33	34	33	33	-	39
December.....	33	34	36	39	40	36	35	34	34	33	34	34	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33

180. Yellowstone River at Billings, Mont. (6-2145)

Summary of once-daily temperature readings at Billings Water Works

		Jan		Feb		Mar		Apr		May		June		July		Aug		Sept		Oct		Nov		Dec	
1934	Max	32	32	39	32	44	34	61	39	66	54	64	59	72	63	71	58	60	40	52	41	41	32	32	32
	Min																								
1935	Max	32	32	32	32	40	32	53	33	60	46	63	57	73	62	72	62	62	49	56	33	33	32	32	32
	Min																								
1936	Max	32	32	32	32	39	32	54	32	63	48	72	52	76	67	73	63	66	52	53	41	40	33	36	32
	Min																								
1937	Max	32	32	32	32	35	32	51	35	58	50	65	52	72	63	69	62	66	51	58	47	48	32	36	32
	Min																								
1938	Max	32	32	32	32	44	32	54	36	58	50	64	50	70	62	72	63	65	60	62	42	47	32	38	32
	Min																								
1939	Max	32	32	32	32	45	32	60	40	65	48	66	56	74	62	70	61	71	52	59	41	44	34	40	32
	Min																								
1940	Max	32	32	34	32	46	32	51	40	60	52	66	50	76	63	72	62	66	57	58	45	47	32	36	32
	Min																								
1941	Max	32	32	32	32	46	32	52	42	62	54	67	53	72	62	72	64	62	46	50	40	42	32	38	32
	Min																								
1942	Max	32	32	32	32	39	32	56	38	60	44	58	53	68	58	69	62	64	49	55	38	40	34	34	32
	Min																								
1943	Max	32	32	34	32	38	32	55	40	57	44	60	50	67	57	67	63	62	47	58	42	42	34	37	32
	Min																								
1944	Max	34	32	33	32	38	32	53	36	60	48	60	50	67	59	67	60	63	50	51	43	46	34	36	32
	Min																								
1945	Max	32	32	32	32	45	32	50	38	62	46	62	44	67	52	67	57	65	46	52	42	50	34	40	32
	Min																								
1946	Max	36	32	36	32	50	34	58	46	60	46	62	51	71	60	70	59	64	50	57	42	43	36	40	34
	Min																								
1947	Max	37	34	37	34	48	35	56	42	58	50	59	52	70	56	71	63	68	52	57	44	46	34	36	32
	Min																								
1948	Max	35	32	36	33	43	33	54	39	62	47	63	53	69	63	68	63	65	53	57	43	45	34	35	34
	Min																								
1949	Max	34	32	33	32	38	32	56	40	62	47	61	52	67	59	68	62	62	46	57	35	44	38	37	33
	Min																								
1950	Max	34	33	34	33	42	33	52	36	58	42	59	46	65	58	65	58	68	45	55	40	47	34	38	33
	Min																								
1951	Max	35	33	35	32	40	32	56	40	61	48	60	45	68	54	68	58	61	47	54	39	40	34	39	33
	Min																								
1952	Max	34	32	35	32	42	33	60	40	58	48	62	54	67	59	68	60	65	55	56	43	45	33	36	33
	Min																								
1953	Max	36	33	40	32	48	33	54	37	59	41	62	50	69	60	69	60	66	54	55	42	47	35	38	33
	Min																								
1954	Max	35	32	38	32	41	33	54	35	60	39	64	52	70	59	69	63	67	51	53	40	44	35	35	32
	Min																								
1955	Max	34	32	34	32	34	32	51	33	62	51	63	54	74	57	72	65	68	47	54	42	39	32	34	32
	Min																								
1956	Max	34	32	34	32	41	32	53	41	60	41	61	53	69	58	68	54	62	52	54	36	42	31	35	30
	Min																								
1957	Max	33	30	34	30	46	31	56	39	60	44	60	48	66	56	70	60	62	44	60	37	44	31	36	31
	Min																								
1958	Max	34	31	39	32	48	32	54	38	61	50	66	54	70	60	73	61	66	50	54	40	43	32	36	30
	Min																								
1959	Max	34	30	32	30	45	32	50	40	58	47	64	54	72	57	72	62	66	48	53	42	44	33	36	32
	Min																								
1960	Max	32	32	34	32	50	32	56	41	64	47	64	54	72	65	75	60	68	54	56	42	43	33	38	33
	Min																								
1961	Max	36	32	40	34	48	36	55	44	62	48	69	53	74	68	76	66	68	50	55	38	42	34	37	32
	Min																								
1962	Max	34	30	32	30	40	30	57	39	61	47	60	48	66	59	68	56	58	52	53	44	48	34	38	31
	Min																								
1963	Max	32	30	37	30	48	34	53	40	56	50	60	50	67	57	70	62	66	56	58	40	43	33	35	32
	Min																								
1964	Max	33	32	32	32	41	32	53	38	60	45	58	49	67	57	67	54	59	48	52	43	47	31	32	32
	Min																								
1965	Max	33	32	32	32	33	32	52	33	56	42	55	48	64	54	67	56	60	42	51	45	46	32	40	32
	Min																								

Extremes for years 1934-65

	Max	37	30	40	30	50	30	61	32	66	39	72	44	76	52	76	54	71	40	62	33	50	31	40	30
	Min																								

181. Bighorn River near St. Xavier, Mont. (6-2870)

Location.--At gaging station, lat 45°19'00", long 107°55'05", in NW¼NE¼ sec.16, T.6 S., R.31 E., on right bank 800 ft downstream from Yellowtail afterbay dam, 1,500 ft downstream from Lime Kiln Creek, and 14 miles southwest of St. Xavier. Datum of gage is 3,156.7 ft (levels by Bureau of Reclamation).

Drainage area.--19,667 sq mi.

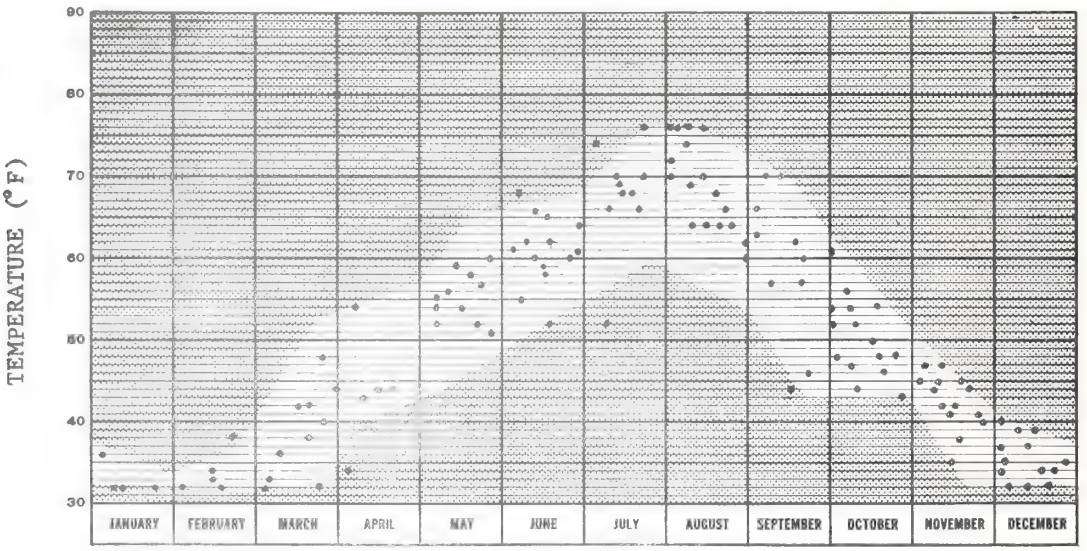
Water temperature records available.--132 spot observations made at time of discharge measurements during period August 1949 to December 1965. Thermograph record during period December 1962 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1934-65: Maximum, 37,400 cfs June 16, 1935; minimum, 228 cfs Dec. 9, 1937.

Water temperatures 1949-65: Maximum observed, 78°F July 27, 1956; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures since November 1965 affected by storage in Yellowtail Reservoir. Water is drawn from reservoir at about the midpoint.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1962-65.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
9-58	1530	32	26-52	1530	38	27-52	1330	40	9-52	1700	43	5-53	1730	54	10-52	1730	66
5-63	1050	36	18-54	1300	34	27-53	1630	48	13-55	1630	44	10-54	1400	59	14-54	1330	62
8-64	1100	32	20-63	1355	32	22-54	1400	38	7-60	1330	54	23-55	1430	57	15-55	1400	62
8-65	1200	32	3-64	1250	32	22-58	1430	42	16-61	0900	44	8-56	1700	56	6-56	1815	61
27-65	1330	32	18-65	1300	33	20-63	1240	42	3-64	1700	34	5-60	1200	52	8-56	1330	62

181. Bighorn River near St. Xavier, Mont. (6-2870)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						4-64	1530	33				26-60	1700	60	14-57	1530	52
						3-65	1100	32				5-61	1415	54	13-60	1400	65
						12-65	1100	36				21-63	1535	58	7-61	1945	68
						25-65	1200	32				5-64	1700	54	4-63	1230	61
						31-65	1240	44				5-65	0950	55	7-63	1100	55
												11-65	1415	54	17-63	1200	58
												22-65	1620	52	24-63	1600	61
												26-65	1750	51	10-65	1715	60
															16-65	1310	59
															18-65	1700	60
															30-65	1700	64
July			August			September			October			November			December		
20-50	1400	66	2-49	1330	70	21-50	1345	60	29-51	1430	43	10-53	1530	42	3-51	1600	35
14-54	1500	69	31-49	1300	62	20-54	1630	57	18-54	1330	48	15-54	1700	45	2-53	1430	37
13-55	1230	70	24-50	1330	64	12-55	1330	70	18-55	1600	54	15-60	1225	38	20-54	1600	32
27-56	1145	78	11-52	1300	64	3-57	1430	63	9-56	1730	52	13-61	1605	35	18-57	1300	34
8-57	1400	66	6-53	1130	64	18-61	1430	62	7-57	1400	47	14-62	1300	42	12-61	1300	32
19-61	1515	68	13-54	1500	64	6-63	1025	70	2-59	1700	48	5-63	1140	44	13-62	1330	37
8-63	1330	74	5-57	1430	74	3-64	1420	66	6-60	1630	56	12-64	0955	41	2-63	1300	34
9-64	1600	52	6-62	1430	69	10-65	0900	57	9-61	1445	44	3-65	0940	45	4-64	1300	32
9-65	1815	66	2-65	1230	72	17-65	1415	44	1-63	0915	61	4-65	0740	47	2-65	1315	40
15-65	1700	68	10-65	1630	70	23-65	1630	46	1-64	1305	54	5-65	1410	47	8-65	1120	39
22-65	1315	70	18-65	1700	68				1-65	1400	52	8-65	1140	45	15-65	1105	39
			23-65	1430	66				8-65	1010	54	10-65	1300	47	21-65	1120	34
			31-65	1700	60				14-65	0945	50	15-65	1115	45	29-65	1345	35
									20-65	0740	46	19-65	1100	44			
									28-65	0900	48	26-65	1115	41			
												28-65	1320	40			

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max Min	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	38 32
1963	Max Min	33 32	36 32	53 35	56 41	65 51	68 58	74 60	76 63	70 59	63 43	45 32	36 32
1964	Max Min	34 33	35 32	47 32	55 40	66 49	66 51	76 64	76 54	70 49	55 45	51 33	36 32
1965	Max Min	33 32	36 32	44 32	57 41	61 44	65 54	72 63	76 57	65 43	57 --	-- 41	41 35

Extremes for years 1962-65

Max Min	34 32	36 32	53 32	57 40	66 44	68 51	76 60	76 54	70 43	63 43	51 32	41 32

182. Soap Creek near St. Xavier, Mont. (6-2875)

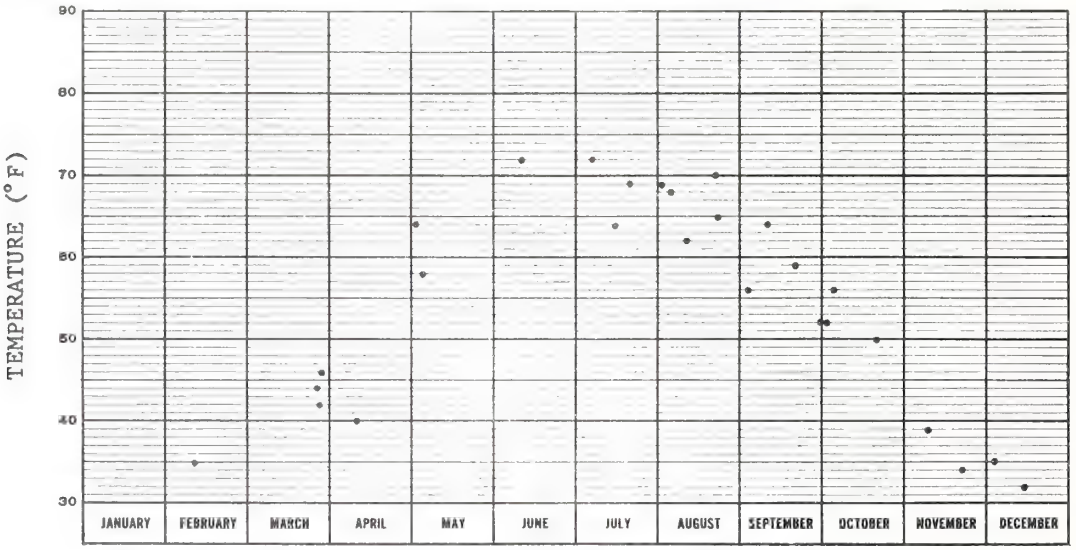
Location.--At gaging station, lat 45°19'38", long 107°46'10", in NE¼ sec.10, T.6 S., R.32 E., 6 miles upstream from mouth and 9½ miles southwest of St. Xavier. Altitude of gage is 3,290 ft (by barometer).

Drainage area.--98.3 sq mi.

Water temperature records available.--28 spot observations made at time of discharge measurements during period August 1949 to September 1953.

Extremes.--Discharge 1913, 1939-53: Maximum, 1,300 cfs May 13, 1942; minimum daily, 1 cfs Jan. 24, 25, 1952.

Water temperatures, 1949-53: Maximum observed, 72°F June 10, 1952, July 6, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
			9-53	1400	35	27-52	1600	42	9-52	1200	40	2-52	1200	64	10-52	1230	72
						27-52	1730	42				5-53	1230	58			
						28-52	1800	46									
						27-53	1130	44									
July			August			September			October			November			December		
19-50	1330	69	2-49	1500	69	30-49	1000	52	19-50	1200	50	8-51	1400	39	14-49	1300	32
15-52	1200	64	23-50	1400	65	20-50	1600	59	2-51	1130	52	23-52	1100	34	3-51	1200	35
6-53	1300	72	22-51	1630	70	9-52	1030	64	4-52	1100	56						
			11-52	1030	62	3-53	1600	56									
			6-53	1400	68												

183. Bighorn River at Two Leggins Bridge, near Hardin, Mont. (6-2885)

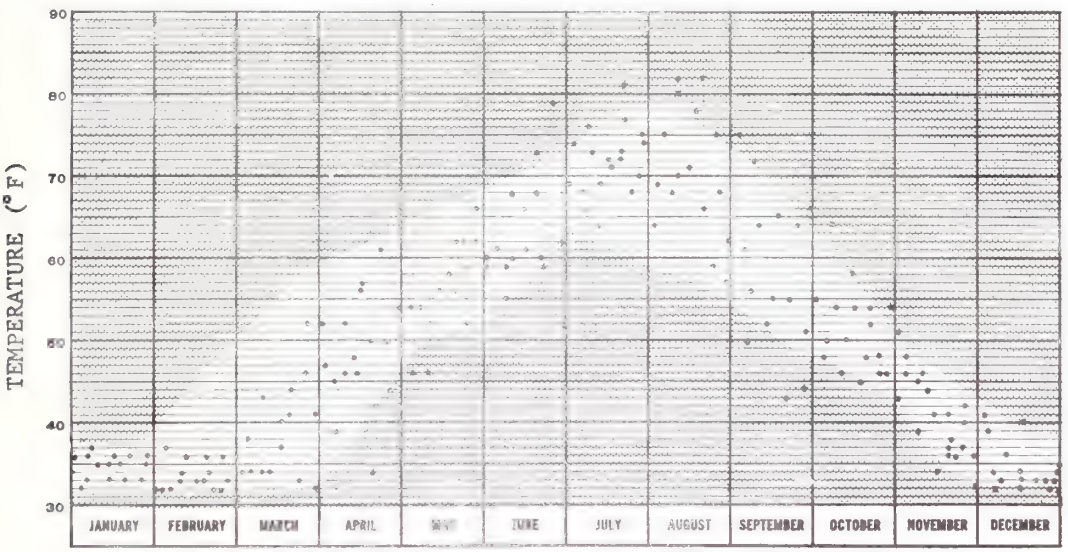
Location.--At thermograph site, lat 45°38'18", long 107°39'59", in SW¼ sec.20, T.2 S., R.33 E., under county road bridge just upstream from Two Leggins Canal diversion dam, 0.2 mile upstream from Two Leggins Creek, 7¼ miles southwest of Hardin, and 10 miles upstream from former gage site. Altitude of gage is 2,935 ft (from topographic map).

Water temperature records available.--207 spot observations made at former gage site near Hardin at weekly intervals during period November 1961 to December 1965. Thermograph record during period December 1962 to December 1965 (some fragmentary) published in reports of the Geological Survey as Bighorn River near Hardin.

Extremes.--Discharge 1904-25, 1928-32: Maximum observed, 45,900 cfs Mar. 11, 1929; minimum observed, 353 cfs Feb. 14, 1933.

Water temperatures 1961-65: Maximum observed, 82°F Aug. 13, 1962, Aug. 19, 1963; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department. Weekly observations supplied by Federal Water Pollution Control Administration.



Spot observations of water temperatures, 1961-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1962-65.

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max	--	--	--	--	--	--	--	--	--	--	--	38
	Min	--	--	--	--	--	--	--	--	--	--	--	33
1963	Max	37	49	59	61	68	72	75	79	71	63	43	36
	Min	32	33	34	40	51	57	63	63	60	44	34	32
1964	Max	34	--	--	--	67	67	79	78	65	56	50	34
	Min	32	32	32	--	--	53	67	55	49	44	32	32
1965	Max	33	32	46	60	--	68	72	--	--	--	--	--
	Min	32	32	32	44	--	--	--	--	--	--	--	32

Extremes for years 1962-65

Max	37	49	59	61	68	72	79	79	71	63	50	38
Min	32	32	32	40	51	53	63	55	49	44	32	32

183. Bighorn River at Two Leggins Bridge, near Hardin, Mont. (6-2885)
Weekly observations of water temperatures

Date	°F	Date	°F	Date	°F	Date	°F	Date	°F	Date	°F
January		February		March		April		May		June	
2-62	36	5-62	32	5-62	34	2-62	47	7-62	54	4-62	61
8-62	37	12-62	36	12-62	34	9-62	46	14-62	56	11-62	68
15-62	36	19-62	34	19-62	41	16-62	57	21-62	62	18-62	73
22-62	36	26-62	33	26-62	46	23-62	61	28-62	66	25-62	79
29-62	36	4-63	37	4-63	38	30-62	54	20-63	56	3-63	61
7-63	36	11-63	36	11-63	43	1-63	52	27-63	62	10-63	60
14-63	35	18-63	36	18-63	44	8-63	52	4-64	46	17-63	68
21-63	36	25-63	36	26-63	52	15-63	56	11-64	52	24-63	64
28-63	35	3-64	32	2-64	34	22-63	42	18-64	62	1-64	59
6-64	33	10-64	34	9-64	34	6-64	39	25-64	59	8-64	59
13-64	33	17-64	33	16-64	37	13-64	48	3-65	54	15-64	66
20-64	33	24-64	32	23-64	33	20-64	34	10-65	46	22-64	59
27-64	33	1-65	32	30-64	41	27-64	44	17-65	58	29-64	52
4-65	32	8-65	33	1-65	34	5-65	45	24-65	52	1-65	60
11-65	35	15-65	33	8-65	34	12-65	46			7-65	55
18-65	35	22-65	32	15-65	40	19-65	50			14-65	61
25-65	33			30-65	32	26-65	50			21-65	60
										29-65	62
July		August		September		October		November		December	
2-62	74	6-62	75	4-62	61	1-62	55	19-61	36	3-62	39
9-62	73	13-62	82	10-62	64	8-62	54	25-61	37	10-62	36
16-62	71	20-62	79	17-62	65	15-62	54	5-62	48	17-62	40
23-62	77	27-62	68	24-62	64	22-62	52	13-62	44	24-62	33
28-62	75	5-63	75	3-63	75	29-62	54	19-62	38	31-62	35
1-63	69	12-63	80	9-63	72	7-63	64	26-62	42	2-63	41
8-63	76	19-63	82	16-63	65	14-63	58	4-63	46	9-63	33
15-63	72	26-63	75	23-63	64	21-63	54	11-63	46	16-63	34
22-63	81	3-64	69	30-63	66	28-63	46	18-63	41	23-63	33
29-63	74	10-64	70	8-64	56	5-64	50	26-63	40	30-63	34
6-64	66	17-64	78	14-64	55	12-64	50	1-64	51	7-64	32
13-64	69	24-64	59	21-64	55	19-64	48	9-64	45	14-64	32
20-64	73	31-64	62	28-64	51	26-64	46	16-64	34	21-64	33
27-64	70	2-65	64	7-65	50	4-65	48	23-64	36	28-64	32
6-65	68	9-65	68	13-65	52	11-65	46	30-64	32	6-65	34
12-65	64	16-65	71	20-65	43	18-65	45	1-65	43	15-65	33
19-65	72	23-65	66	27-65	44	25-65	48	8-65	39	22-65	33
26-65	68	30-65	57					15-65	41	27-65	33
								22-65	37		
								29-65	36		

184. Little Bighorn River at State line, near Wyola, Mont. (6-2890)

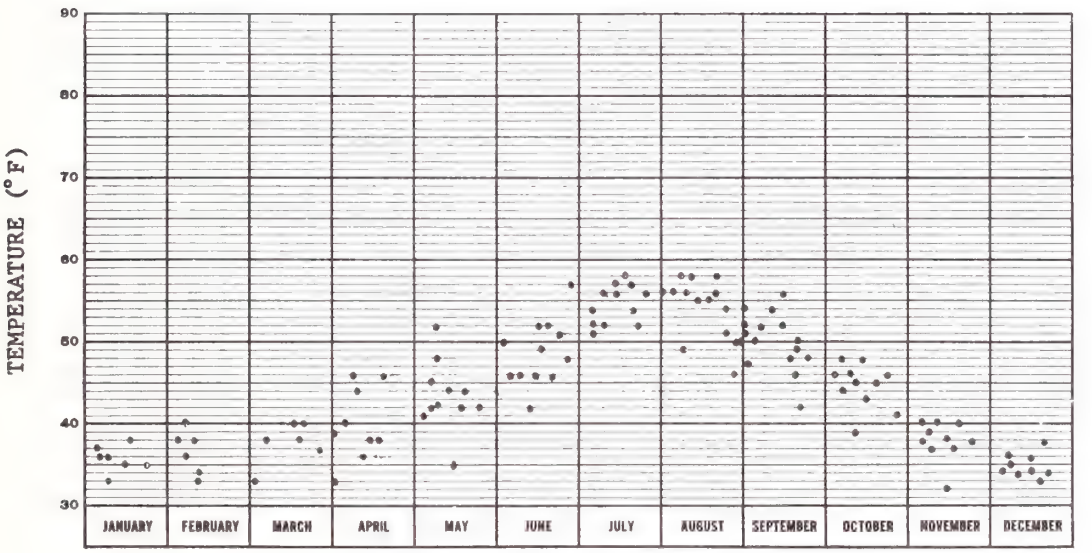
Location.--At gaging station, lat 45°01', long 107°37', in SW¼NW¼ sec.36, T.9 S., R.33 E., on right bank half a mile north of Montana-Wyoming State line, 1 mile downstream from West Fork, and 13 miles southwest of Wyola. Altitude of gage is 4,450 ft (from topographic map).

Drainage area.--193 sq mi.

Water temperature records available.--131 spot observations made at time of discharge measurements during period July 1949 to December 1965.

Extremes.--Discharge 1939-65: Maximum, 2,730 cfs June 3, 1944; minimum, 21 cfs Dec. 27, 1954.

Water temperatures 1949-65: Maximum observed, 58°F Aug. 5, 1953, Aug. 22, 1956, Aug. 7, 1962, Aug. 7, 1963, July 14, 1964; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

184. Little Bighorn River at State line, near Wyola, Mont. (6-2890)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-53	1330	36	4-52	1600	38	29-50	1500	37	4-53	1530	40	5-52	1800	48	15-55	1500	49
25-56	1430	35	10-53	1400	33	21-51	1730	40	11-56	1630	38	5-53	1730	52	7-56	1200	46
6-58	1400	36	8-61	1515	38	20-52	1400	38	12-57	1100	38	9-56	1730	44	29-56	1400	57
12-61	1525	38	5-63	1605	40	17-53	1500	40	15-58	1630	46	15-57	1630	44	18-57	1300	46
4-63	1120	37	5-64	0905	36	18-63	1530	40	7-59	1400	44	4-60	0945	42	2-59	1730	50
6-64	1530	33	10-65	1005	34	2-64	1810	33	6-60	1200	46	4-61	1715	45	17-60	1430	52
11-65	1610	35				9-65	1610	38	15-61	1000	38	14-62	1650	42	24-60	1215	51
									12-62	0820	36	3-63	0910	41	15-61	1100	52
									16-63	1610	46	23-63	1000	42	12-62	1030	46
									1-64	1800	33	5-64	1100	42	5-63	1540	46
									1-65	1005	39	12-65	1145	35	25-63	1310	51
															11-65	1000	42
															25-65	1245	48
July			August			September			October			November			December		
16-49	1200	57	3-49	1400	56	18-50	1430	50	27-49	1630	41	16-50	1700	37	18-51	1300	34
17-50	1600	52	30-49	1200	50	18-51	1600	49	8-53	1200	45	5-51	1510	40	8-52	1630	36
16-52	1430	54	21-50	1530	52	10-52	1330	54	19-55	1530	46	27-51	1530	38	13-56	1500	36
21-54	1700	56	21-51	1730	54	1-53	1500	54	11-56	1400	48	5-52	1600	38	17-57	1530	38
9-57	1600	56	12-52	1430	55	21-54	1800	48	8-57	1600	39	17-54	1600	40	15-60	1000	33
7-58	1730	51	5-53	1430	58	13-55	1430	52	7-58	1700	46	7-56	1500	37	13-61	0925	34
11-60	1400	56	16-55	1500	56	13-56	1700	56	5-59	1600	44	9-59	1800	40	10-62	1530	34
7-61	1000	54	22-56	1730	58	5-57	1330	52	5-60	1445	48	16-60	1540	37	4-63	0840	34
11-62	1805	57	6-57	1330	56	16-58	1830	48	12-62	0850	43	15-61	1120	32	8-65	1150	35
9-63	1130	52	1-60	1100	56	1-59	1300	51	3-63	0915	46	15-62	1300	38			
14-64	0900	58	8-61	1400	55	1-60	1800	52	15-64	1535	45	7-63	0900	39			
7-65	1825	52	7-62	1650	58	19-61	0940	42									
			29-62	1600	46	18-62	0920	46									
			7-63	1530	58	3-63	1600	50									
			6-64	0835	49	2-64	0900	47									
			31-64	1430	50												
			6-65	0835	49												
			31-65	1430	50												

185. Pass Creek near Wyola, Mont. (6-2900)

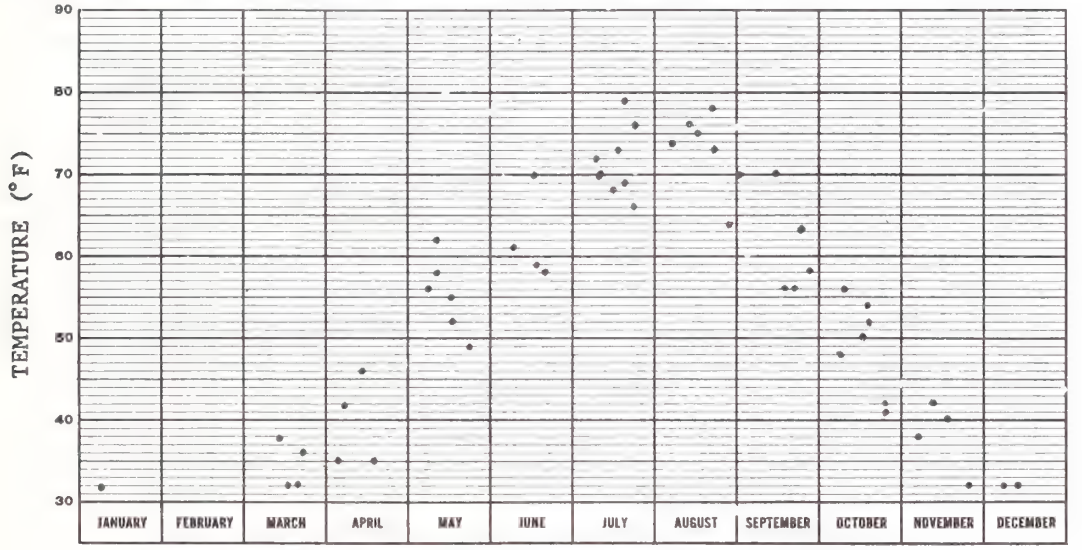
Location.--At gaging station, lat 45°03', long 107°21', in NE¼ sec.13, T.9 S., R.35 E., on right bank 100 ft upstream from highway bridge, 1 mile downstream from Twin Creek, 5 miles south of Wyola, and 6 miles upstream from mouth. Altitude of gage is 3,860 ft (from topographic map).

Drainage area.--111 sq mi.

Water temperature records available.--53 spot observations made at time of discharge measurements during period July 1949 to October 1956.

Extremes.--Discharge 1935-56: Maximum observed, 1,150 cfs June 4, 1944; no flow Aug. 3, 9, 10, 1935.

Water temperatures 1949-56: Maximum observed, 79°F July 16, 1954; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-56

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-53	1630	32				22-51	1030	32	3-52	1200	35	4-51	1200	56	13-52	1400	70
						20-52	1600	32	6-53	1730	42	6-52	1430	58	14-54	1900	59
						17-53	1700	38	14-55	1700	35	6-53	1430	62	15-55	1730	58
						23-54	1200	36	12-56	1400	46	10-54	1830	55	6-56	1600	61
												24-55	1530	49			
												10-56	1530	52			
July			August			September			October			November			December		
14-49	1800	73	30-49	1100	64	28-49	1500	58	28-49	1200	42	27-51	1700	32	13-49	1330	32
17-50	1730	66	22-50	1400	73	19-50	1400	56	18-50	1630	50	6-52	1500	38	9-52	1600	32
16-52	1700	69	12-52	1630	75	17-51	1530	56	28-51	1500	41	11-53	1500	42			
7-53	1400	72	5-53	1230	74	1-53	1700	70	8-53	1000	48	17-54	1430	40			
8-54	1300	70	11-54	1500	76	22-54	1600	63	19-54	1530	54						
16-54	1830	79	12-55	1300	76	13-55	1700	70	19-55	1400	52						
13-55	2000	68	22-56	1730	78				10-56	1730	56						
18-56	1500	76															

186. Little Bighorn River below Pass Creek, near Wyola, Mont. (6-2905)

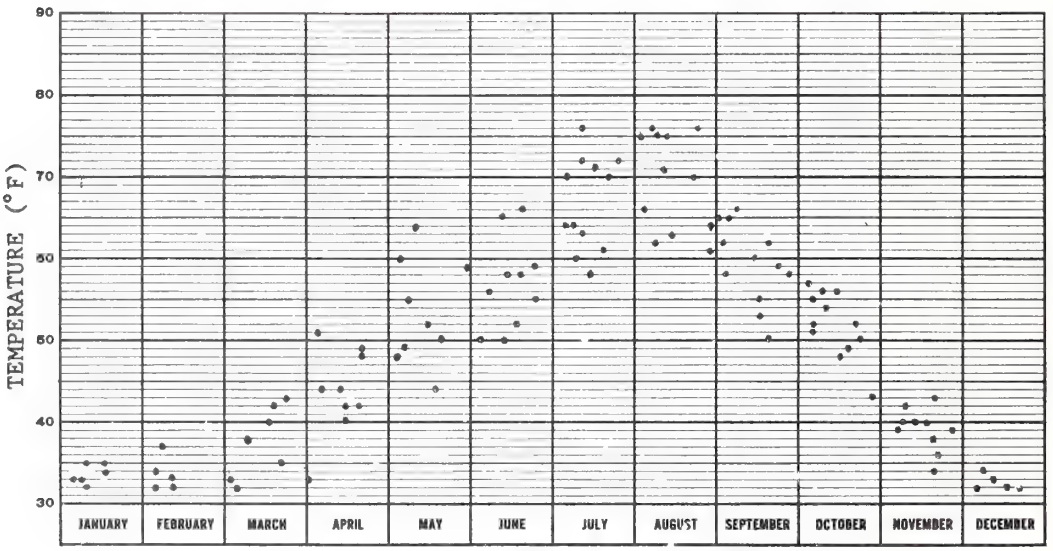
Location.--At gaging station, lat 45°10', long 107°23', in W½SW¼ sec.35, T.7 S., R.35 E., on right bank 3½ miles north of Wyola and 4 miles downstream from Pass Creek. Altitude of gage is 3,600 ft (from topographic map).

Drainage area.--428 sq mi.

Water temperature records available.--111 spot observations made at time of discharge measurements during period July 1949 to December 1958, August 1959 to December 1965.

Extremes.--Discharge 1939-58, 1959-65: Maximum, 3,630 cfs June 14, 1963; minimum, 12 cfs Aug. 5, 7, 8, 1961.

Water temperatures 1949-58, 1959-65: Maximum observed, 76°F Aug. 4, 1953, Aug. 24, 1956, July 11, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-58, 1959-65

186. Little Bighorn River below Pass Creek, near Wyola, Mont. (6-2905)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-53	1030	33	10-53	1600	33	21-51	1530	43	6-53	1300	44	4-51	1600	60	11-52	1800	65
6-58	1600	35	7-61	1550	37	20-52	1200	35	11-56	1500	44	5-52	1600	55	16-55	1830	58
12-61	1445	35	5-63	1450	32	17-53	1245	40	12-57	1300	40	6-53	1600	64	15-57	1430	52
4-63	1345	33	5-64	1030	34	3-62	1030	32	16-58	1330	49	9-56	1500	52	17-60	1730	66
6-64	1330	32	10-65	1140	32	18-63	1400	42	6-60	1240	51	31-56	1455	59	12-62	1400	58
12-65	1350	34				2-64	1630	33	15-61	1200	42	4-60	1045	48	6-63	1620	56
						9-65	1440	38	12-62	1000	42	14-62	1525	50	25-63	1435	59
									16-63	1450	48	3-63	1115	48	3-65	1245	50
									1-64	1600	33	4-64	1630	49	11-65	1225	50
												12-65	1345	44	25-65	1410	55
July			August			September			October			November			December		
15-49	1500	71	3-49	1230	66	28-49	1700	58	18-50	1430	52	27-51	1330	39	13-49	1500	32
18-50	1130	61	20-49	1400	64	19-50	1555	62	28-51	1400	43	16-54	1600	43	15-60	1120	32
8-53	1100	64	22-50	1600	70	17-51	1330	53	8-53	1430	54	6-56	1700	40	13-61	1210	32
21-54	1830	70	12-52	1200	63	21-54	1600	59	19-55	1130	50	5-57	1530	39	10-62	1400	33
26-56	1130	72	4-53	1800	76	5-57	1500	66	11-56	1500	56	12-58	1500	40	4-63	1000	32
10-57	1100	63	24-56	1230	76	16-58	1600	60	7-58	1500	56	9-59	1530	40	6-65	1330	34
11-60	1700	76	6-57	1730	75	1-60	1500	65	5-59	1300	52	16-60	1430	36			
7-61	1300	70	2-60	1700	75	19-61	1415	50	5-60	1405	55	15-61	1325	34			
11-62	1610	72	8-61	1200	75	17-62	1700	55	12-62	1010	48	15-62	1135	38			
9-63	0915	60	7-62	1825	71	3-63	1500	65	3-63	1100	57	7-63	0945	42			
13-64	1600	58	30-62	1555	61	2-64	1100	58	15-64	1245	49						
7-65	1630	64	6-65	1850	62	2-65	1445	62	5-65	1435	51						

187. Lodgegrass Creek above Willow Creek diversion, near Wyola, Mont. (6-2915)

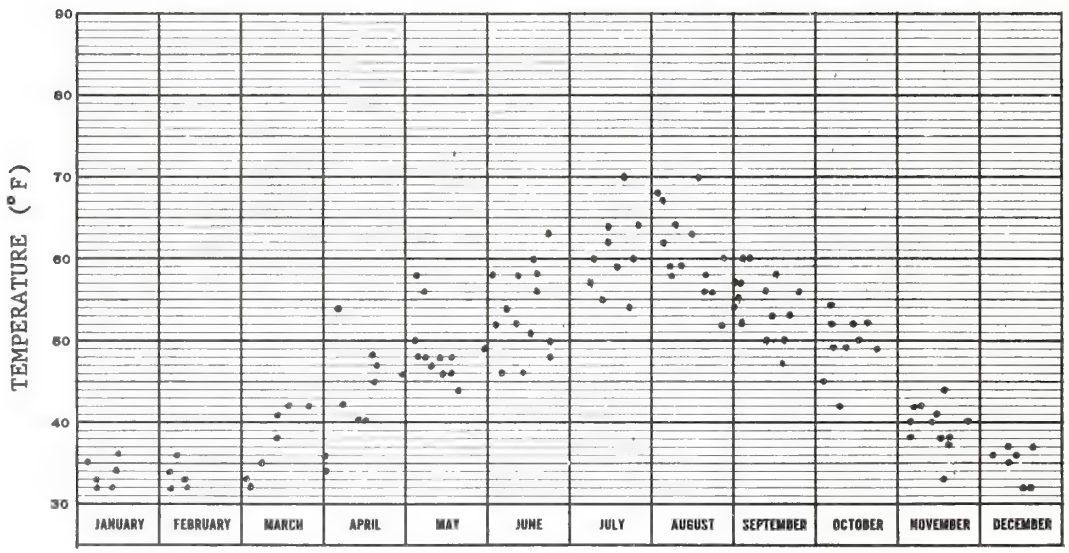
Location.--At gaging station, lat 45°07', long 107°36', in W½NW¼ sec.19, T.8 S., R.34 E., on left bank half a mile upstream from Willow Creek diversion canal, 1½ miles downstream from Spring Creek, and 10 miles west of Wyola. Altitude of gage is 4,360 ft (from topographic map).

Drainage area.--80.7 sq mi.

Water temperature records available.--126 spot observations made at time of discharge measurements during period May 1949 to December 1965.

Extremes.--Discharge 1939-65: Maximum, 1,130 cfs June 9, 1964; minimum daily, 3 cfs Jan. 17, 18, 25, 30, 31, 1950, Jan. 15, 16, 1954.

Water temperatures 1949-65: Maximum observed, 70°F July 15, 1949, Aug. 16, 1955; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

187. Lodgegrass Creek above Willow Creek diversion, near Wyola, Mont. (6-2915)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
6-53	1500	32	11-53	1000	32	21-51	1230	42	30-51	1330	46	6-49	1100	47	11-52	1500	58
10-58	1100	32	7-61	1325	36	28-52	1300	42	11-56	1300	40	5-52	1245	48	16-55	1330	58
12-61	1255	36	5-63	1230	32	18-53	1430	41	15-58	1200	48	5-53	1430	56	7-56	1800	54
4-63	1525	35	5-64	1200	34	3-62	1550	32	7-59	1700	42	9-56	1300	48	14-57	0800	51
6-64	1200	33	10-65	1305	33	18-63	1310	38	6-60	1515	54	31-56	1245	49	2-59	1400	58
11-65	1405	34				2-64	1330	33	15-61	1615	45	16-57	1130	44	16-60	1200	56
						9-65	1315	35	12-62	1120	40	13-58	1300	48	15-61	1700	60
									16-63	1315	47	4-60	1230	48	12-62	1525	46
									1-64	1330	34	4-61	1330	58	25-62	1710	63
									1-65	1600	36	14-62	1415	46	5-63	1100	46
												3-63	1300	50	25-63	1000	48
												4-64	1400	48	3-65	1500	52
												12-65	1540	46	11-65	1520	52
															25-65	1620	50
July			August			September			October			November			December		
15-49	1200	70	3-49	1030	67	20-50	1130	53	9-53	1030	49	16-50	1330	37	15-49	1200	32
19-50	1030	54	30-49	1530	60	19-51	1000	50	20-55	1100	49	11-51	1500	40	8-52	1300	35
21-54	1230	60	23-50	1100	56	2-53	1600	52	10-56	1530	52	28-51	1400	40	16-57	1700	37
26-56	1240	64	22-51	1100	56	22-54	1800	56	8-57	1200	42	5-52	1300	40	15-60	1335	32
10-57	1300	55	13-52	1400	63	13-55	1100	50	5-59	1200	49	16-54	1400	44	13-61	1450	32
7-58	1330	57	4-53	1600	62	13-56	1430	56	5-60	1210	52	6-56	1430	42	10-62	1145	36
11-60	2000	62	16-55	1200	70	4-57	1500	60	12-62	1325	50	5-57	1330	38	4-63	1040	36
11-62	1415	64	22-56	1500	58	16-58	1200	53	3-63	1200	45	12-58	1300	41	8-65	1455	37
8-63	1700	60	6-57	0930	59	1-59	0930	54	14-64	1615	52	16-60	1245	38			
13-64	1300	59	2-60	1930	68	2-60	0800	57	5-65	1225	54	15-61	1600	33			
7-65	1430	57	8-61	1930	59	19-61	1225	47				15-62	1000	38			
			8-62	0825	59	17-62	1510	58				7-63	1125	42			
			29-62	1325	52	3-63	1330	60									
			7-63	1220	64	2-64	1325	55									
			6-65	1405	58	1-65	1545	57									

188. Little Bighorn River near Crow Agency, Mont. (6-2935)

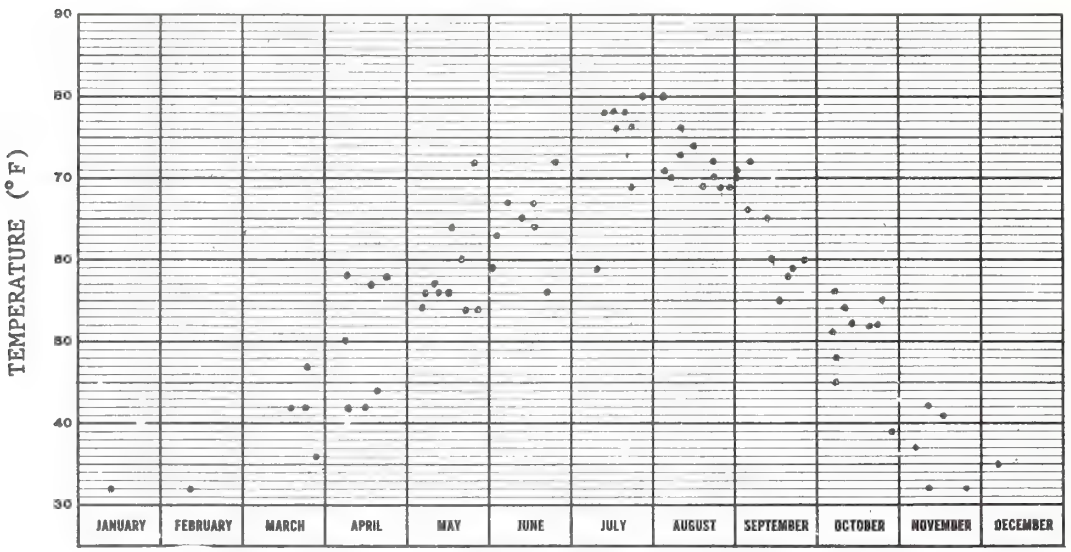
Location.--At gaging station, lat 45°34', long 107°27', in E½SE¼ sec.13, T.3 S., R.34 E., on left bank at Chicago, Burlington & Quincy Railroad bridge, 2 miles south of Crow Agency, and 17 miles upstream from mouth. Datum of gage is 3,045.00 ft above mean sea level, datum of 1929.

Drainage area.--1,181 sq mi.

Water temperature records available.--76 spot observations made at time of discharge measurements during period July 1949 to October 1960.

Extremes.--Discharge 1912-24, 1928-32, 1938-60: Maximum observed, 6,200 cfs July 23, 1923; no flow July 28 to Aug. 6, 1921.

Water temperatures 1949-60: Maximum observed, 80°F July 26, 1956, Aug. 3, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-60

188. Little Bighorn River near Crow Agency, Mont. (6-2935)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-58	1400	32	11-53	1300	32	29-51	1130	36	7-53	1500	42	7-51	1130	57	11-52	1200	65
						18-53	1700	42	13-54	1820	57	8-52	1200	56	15-54	1630	67
						23-54	1430	42	14-55	1500	44	5-53	1130	56	15-55	1730	64
						26-56	1415	47	11-57	1800	42	11-54	1600	64	1-56	0725	59
									16-58	1700	58	24-55	1230	54	5-56	1630	67
									6-59	1800	50	9-56	1000	56	18-57	1700	56
									6-60	1730	58	24-56	1500	72	2-59	1100	63
												16-57	1600	54	24-59	1830	72
												14-58	1430	60			
												4-60	1400	54			
July			August			September			October			November			December		
14-49	1500	76	3-49	0830	71	27-49	1530	60	18-50	1200	52	28-51	1600	32	3-53	1230	35
18-50	1630	76	30-49	1800	69	22-50	1030	59	28-51	1100	39	11-53	1700	42			
18-52	1200	69	23-50	1700	70	17-51	1030	55	7-52	1355	48	16-54	1130	41			
16-54	1230	78	20-51	1130	69	4-52	1615	72	9-53	1330	54	5-57	1100	37			
13-55	1800	78	14-52	1100	74	12-52	1100	65	19-54	1730	52	10-59	1700	32			
26-56	1545	80	4-53	1400	70	1-53	1230	71	20-55	1430	55						
10-57	1630	59	25-53	1105	69	21-54	1430	58	10-56	1230	52						
12-60	1100	78	23-54	1630	72	14-55	1200	60	7-57	1730	45						
			9-55	1400	76	4-57	1210	66	6-59	1500	51						
			8-57	0930	73	1-60	1200	70	7-60	1100	56						
			3-60	1800	80												

189. Little Bighorn River near Hardin, Mont. (6-2940)

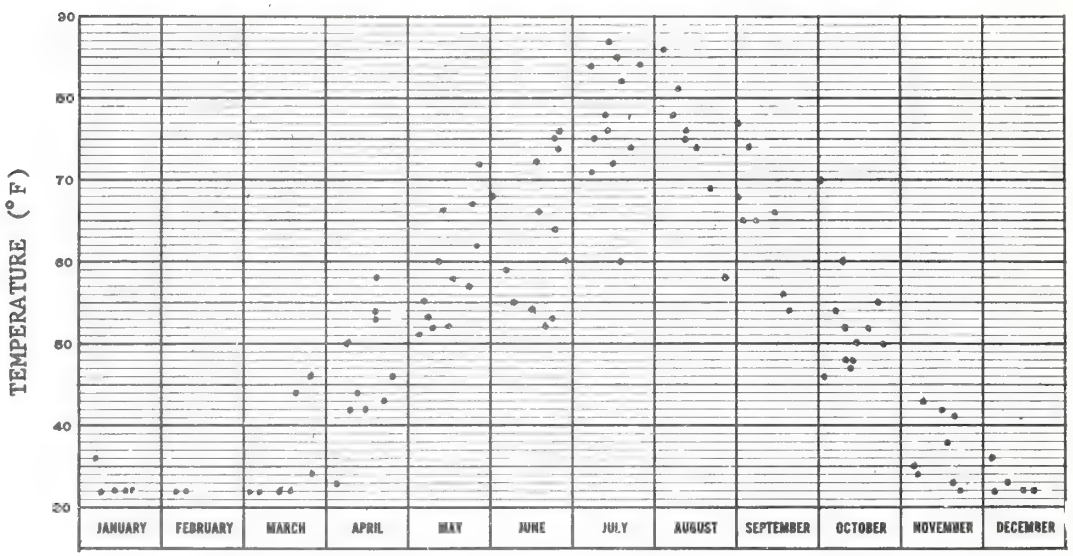
Location.--At gaging station, lat 45°44'10", long 107°33'25", in NE¼NE¼ sec.19, T.1 S., R.34 E., on left bank 50 ft downstream from bridge on Sarpy Road, a quarter of a mile upstream from terminal wasteway of Agency Canal, half a mile upstream from mouth, and 2½ miles east of Hardin. Altitude of gage is 2,890 ft (from topographic map).

Drainage area.--1,294 sq mi.

Water temperature records available.--106 spot observations made at time of discharge measurements during period August 1953 to December 1965.

Extremes.--Discharge 1953-65: Maximum, 4,520 cfs Apr. 2, 1965; minimum observed, 0.2 cfs Aug. 7, 1961.

Water temperatures 1953-65: Maximum observed, 87°F July 12, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1953-65

189. Little Bighorn River near Hardin, Mont. (6-2940)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-58	1600	32	7-61	1015	32	23-54	1600	46	13-54	1700	58	11-54	1800	66	16-54	1100	66
13-61	1520	32	5-64	1330	32	17-55	1000	32	14-55	1130	43	21-54	1700	67	21-54	1500	75
5-63	1200	36	10-65	1700	32	25-60	1230	34	11-57	1600	42	23-55	1830	62	1-56	1520	68
7-64	1700	32				2-62	1600	32	17-58	0900	53	8-56	1730	60	17-57	1400	52
12-65	1530	32				15-62	1100	32	8-59	1200	42	24-56	1200	72	19-57	1300	53
						19-63	1500	44	7-60	0800	50	20-57	1300	57	24-59	1330	74
						4-64	1030	32	16-61	1400	46	4-60	1600	55	24-60	1520	76
									10-62	1120	44	5-61	1215	53	16-61	0830	72
									17-63	1415	54	14-62	1045	58	25-62	1450	74
									3-64	1100	33	3-63	1700	51	4-63	1800	59
												6-64	1800	52	8-63	1000	55
												13-65	1030	52	24-63	1145	64
															11-64	1300	54
															26-65	1450	60
July			August			September			October			November			December		
15-54	1700	85	6-53	1530	78	1-53	1330	77	7-52	1740	52	12-53	1230	42	3-53	1500	36
12-55	1500	72	23-54	1100	69	21-54	0900	54	18-54	1630	55	15-54	1230	41	18-57	1700	32
16-56	1730	82	12-55	0930	74	12-55	1730	66	19-55	0930	50	6-56	1000	34	13-60	1600	32
26-56	1650	84	8-57	1430	81	4-57	0900	65	10-56	0930	50	5-57	0900	35	15-61	1305	32
8-58	1630	75	3-60	1530	86	1-60	1045	68	8-57	1000	48	15-60	1645	33	13-62	1010	32
12-60	1430	87	29-62	1055	58	20-61	1325	56	9-58	1000	47	16-61	0935	32	4-63	1245	32
7-61	1600	84	9-63	1030	76	6-63	1340	74	2-59	1030	46	14-62	1000	38	8-65	1635	33
11-62	1145	76	9-65	1110	75	2-64	1625	65	7-60	1500	60	7-63	1400	43			
11-63	1200	78							9-61	1605	48						
19-63	1030	74							1-63	1420	70						
15-64	1130	60							15-64	1000	52						
7-65	1200	71							5-65	1040	54						

190. Bighorn River at Bighorn, Mont. (6-2947)

Location.--At gaging station, lat 46°08'50", long 107°28'00", in NE¼NE¼ sec.33, T.5 N., R.34 E., on right bank just downstream from bridge on old U. S. Highway 10, a quarter of a mile downstream from bridge on Interstate Highway 94, three-quarters of a mile upstream from mouth, 1 mile southwest of Bighorn and 4 miles east of Custer. Prior to Oct. 6, 1955, gaging station at site 4 miles upstream. Altitude of gage is 2,690 ft (by barometer).

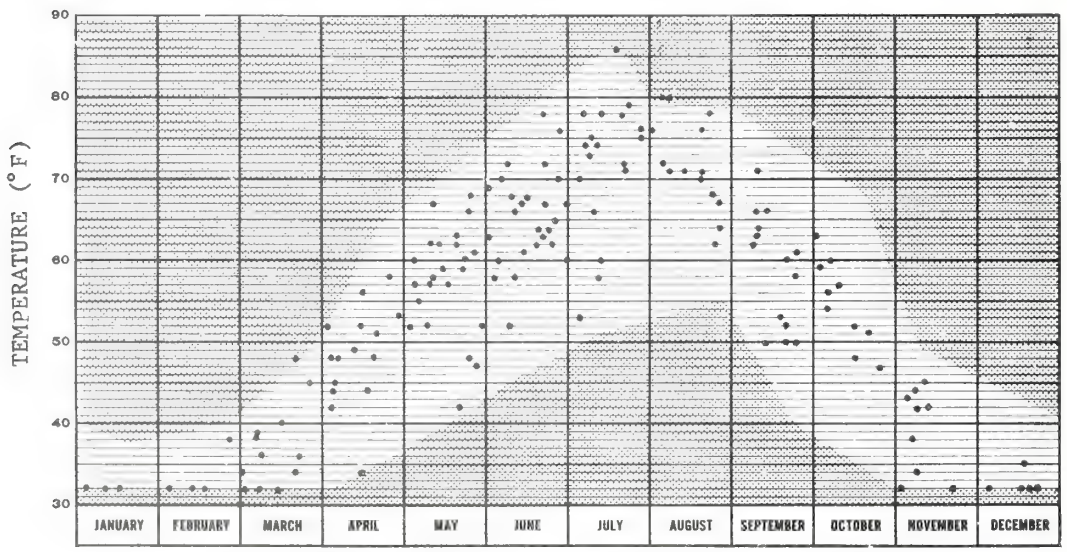
Drainage area.--22,885 sq mi.

Water temperature records available.--229 spot observations made at time of discharge measurements during period May 1949 to December 1965, including 57 observations made at time of water quality sampling. Once- or twice-daily observations made during period April 1949 to December 1965 (incomplete) published in reports of the Geological Survey, all at present site.

Extremes.--Discharge 1945-65: Maximum, 26,200 cfs June 24, 1947; minimum, about 275 cfs Nov. 15, 1959.

Water temperatures 1949-65 (revised): Maximum observed, 86°F July 17, 18, 1953; minimum, freezing point on many days during winter months.

Remarks.--Maximum of 89°F observed Aug. 7, 1953 and published in WSP 1291 subsequently has been found to be incorrect and should not be used.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest temperatures from once-daily observations, 1949-65.

190. Bighorn River at Bighorn, Mont. (6-2947)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
2-52	1450	33	4-52	1315	33	6-52	1210	32	16-51	1320	44	23-49	1400	48	19-50	1340	64
4-61	1235	32	26-58	1200	38	7-53	1500	39	4-52	1700	45	11-50	1510	57	9-52	1410	68
15-62	1245	32	12-62	1320	32	16-54	1730	40	16-52	1110	55	22-50	0815	59	30-52	1400	67
14-63	1500	32	16-62	1255	32	22-56	1300	36	25-52	1430	58	11-51	1240	62	3-54	1300	58
6-64	1145	32	3-64	1230	32	26-57	1600	45	3-53	1330	52	9-52	1010	54	29-54	1700	67
11-65	1130	32	4-65	1120	32	8-61	1045	36	15-54	1645	56	14-52	1430	62	4-55	1430	60
						20-61	1130	48	3-56	1730	42	27-52	1900	61	27-55	1200	70
						14-62	1400	32	15-57	1600	52	16-53	1300	57	8-56	1900	72
						1-63	1100	34	7-58	1300	48	6-54	1200	57	26-57	1200	65
						7-63	1345	38	22-59	1330	51	5-55	1800	60	14-58	1030	61
						2-64	1200	32	13-61	1800	49	9-56	1700	52	24-58	1600	62
						19-64	1130	34	3-62	1215	44	25-56	1200	68	1-59	1130	63
						8-65	1130	32	18-62	1110	58	5-58	1200	55	19-59	1130	72
									30-62	1645	53	13-60	1745	67	1-60	1600	69
									4-63	1600	48	23-60	1200	60	10-60	1300	66
									14-64	1200	34	12-61	1430	58	13-60	1350	67
												18-62	1200	62	22-60	1230	64
												2-63	1130	52	30-60	1230	60
												14-63	1055	58	7-61	1100	70
												24-63	1500	66	14-61	1310	68
												30-63	1030	52	20-61	1730	78
												4-64	1500	52	28-61	1230	76
												14-64	1225	59	21-62	0950	67
												19-64	1130	63	27-62	1025	70
												28-64	1255	47	8-63	1545	52
												18-65	1200	42	10-65	1500	58
															17-65	1400	62
															19-65	1610	63

190. Bighorn River at Bighorn, Mont. (6-2947)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
6-49	1300	74	5-49	1300	80	13-50	1330	50	1-51	0830	53	2-51	1055	32	7-51	1045	33
10-50	1400	74	18-50	1330	76	25-50	1225	61	2-51	1555	57	2-51	1530	32	23-57	1200	32
12-51	1300	58	1-52	1230	76	10-51	1300	63	2-51	1800	54	19-51	1300	32	20-58	1600	32
8-53	1300	73	7-52	1900	74*	25-51	1300	50	6-51	0800	51	7-52	1440	44	5-60	0950	32
28-53	1130	76	8-52	1930	74*	1-52	1900	64*	7-51	0800	53	11-53	1200	45	6-61	1015	32
13-54	1630	78	9-52	1900	74*	2-52	1440	66*	8-51	0800	54	8-54	1630	42	5-62	1145	32
6-55	1300	78	10-52	1800	65*	3-52	2000	71*	9-51	0700	53	6-56	1405	38	18-62	1030	35
23-56	1420	79	11-52	1800	64*	4-52	1900	70*	10-51	0800	54	12-57	1500	42	19-63	1200	32
4-57	1130	53	12-52	2000	71*	5-52	1800	70*	11-51	0830	54	12-58	1430	42	5-64	1330	32
8-58	1200	66	14-52	1900	71*	7-52	1900	71*	12-51	1000	52	8-61	1110	34			
23-58	1630	71	15-52	1900	72*	8-52	1900	70*	13-51	0800	52	4-63	1130	43			
28-59	1000	75	16-52	1930	71*	9-52	1730	73*	15-51	0800	50	5-64	1400	43			
8-61	1115	78	17-52	1830	75*	10-52	1830	72*	17-51	1430	45	5-65	1355	47			
18-61	1730	78	18-52	1930	76*	11-52	1900	71*	20-51	0800	40						
9-62	1430	74	19-52	1830	75*	15-52	1900	66*	21-51	0800	40						
3-63	1200	70	20-52	1900	73*	16-52	1900	65*	24-51	0700	40						
8-63	1410	75	21-52	1900	77*	30-52	1450	63*	8-54	1600	57						
13-65	0920	60	22-52	1230	78	8-53	1300	66	14-55	1030	48						
20-65	1000	72	22-52	2000	76*	7-54	1230	66	2-56	1700	59						
			24-52	1815	79*	13-55	1600	66	26-56	1230	47						
			25-52	1930	76*	10-57	1700	64	21-57	1700	51						
			27-52	1900	72*	24-57	1500	58	6-58	1200	56						
			28-52	1900	75*	18-58	1300	60	5-59	1330	54						
			29-52	2000	72*	17-59	1400	53	7-60	1745	60						
			31-52	1800	62*	20-60	1115	60	15-62	1115	52						
			5-54	1300	72	8-61	1330	62	1-63	1100	63						
			7-56	1215	71	21-61	1330	50									
			28-56	1530	64	21-61	1730	52									
			27-57	1230	67	9-63	1330	71									
			20-58	1140	71	9-65	1200	62									
			13-59	1200	71												
			26-60	1300	62												
			7-61	1100	80												
			6-62	1140	71												
			4-65	1200	72												
			17-65	0945	70												
			24-65	1300	68												

* Afternoon readings to supplement morning readings published in WSP 1291; not plotted on graph.

190. Bighorn River at Bighorn, Mont. (6-2947)

Summary of once- or twice-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1949	Max	--	--	--	61	69	71	73	77	65	57	46	38
	Min	--	--	--	47	52	59	65	65	52	34	36	33
1950	Max	--	--	--	57	62	69	72	73	70	55	46	--
	Min	--	--	--	38	42	53	60	62	44	42	32	32
1951	Max	--	--	--	51	65	67	75	75	64	--	--	--
	Min	--	--	--	--	50	48	51	61	41	--	--	--
1952	Max	--	--	--	--	--	--	--	79	73	57	46	--
	Min	--	--	--	--	--	--	--	65	55	42	35	32
1953	Max	--	38	49	65	69	78	86	69	78	68	49	41
	Min	32	33	32	37	40	55	67	65	50	40	35	--
1954	Max	--	--	44	60	72	80	85	76	68	55	47	--
	Min	--	--	32	32	37	52	65	65	47	40	39	32
1955	Max	--	--	--	53	65	71	78	79	68	53	41	--
	Min	33	32	33	34	46	53	63	65	47	40	32	--
1956	Max	34	--	42	54	67	79	76	74	65	60	45	37
	Min	32	--	32	34	45	53	64	56	52	39	33	32
1957	Max	34	32	45	56	67	69	77	74	65	61	44	38
	Min	32	32	32	34	50	55	64	63	49	37	32	32
1958	Max	38	40	47	55	70	67	72	74	66	54	42	--
	Min	32	32	32	42	50	58	57	62	47	40	--	--
1959	Max	--	--	--	--	--	74	77	75	74	55	45	33
	Min	--	--	--	--	--	60	61	65	44	40	32	32
1960	Max	--	--	50	52	65	70	78	76	71	62	43	35
	Min	32	--	--	42	48	59	65	59	54	37	33	32
1961	Max	32	34	48	57	69	75	76	76	68	57	40	36
	Min	32	32	32	38	49	63	65	65	45	35	32	32
1962	Max	32	37	44	60	65	74	75	78	64	57	49	40
	Min	32	32	32	38	50	56	64	55	48	42	35	32
1963	Max	32	35	48	48	61	67	76	77	70	64	44	39
	Min	32	32	33	33	45	56	64	65	59	41	36	32
1964	Max	32	32	40	56	66	70	76	76	64	56	49	32
	Min	32	32	32	38	44	55	68	56	50	39	32	32
1965	Max	33	34	34	51	54	65	75	75	66	55	48	45
	Min	32	32	32	32	38	45	66	59	44	44	32	32
Extremes for years 1949-65													
	Max	38	40	50	65	72	80	86	79	78	68	49	45
	Min	32	32	32	32	37	45	51	55	41	34	32	32

191. Rosebud Creek near Forsyth, Mont. (6-2960)

Location.--At gaging station, lat 46°11'50", long 106°28'25", in SW¼ sec.9, T.5 N., R.42 E., on right bank 5 miles upstream from mouth and 10 miles southwest of Forsyth. Altitude of gage is 2,540 ft (by barometer).

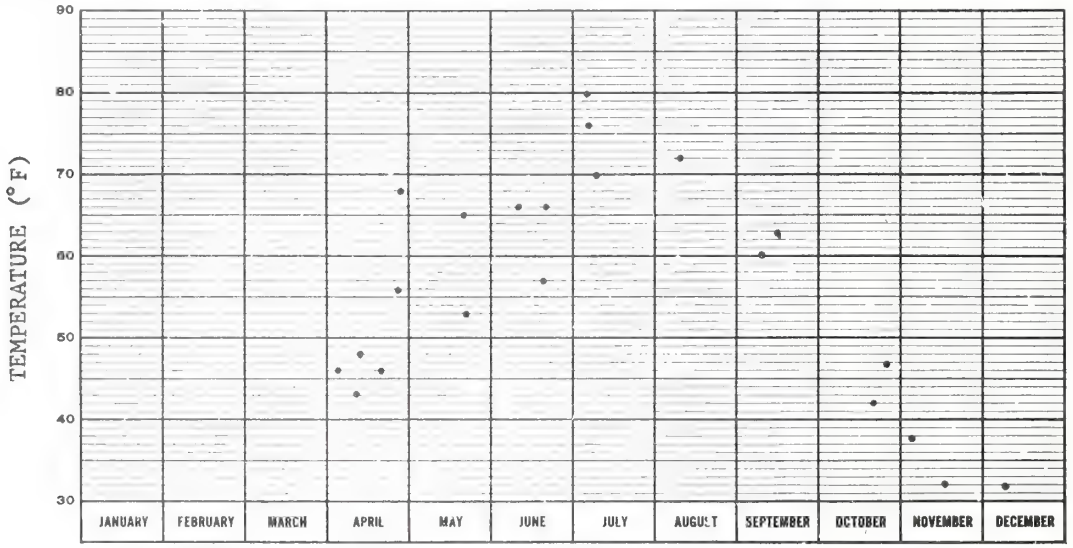
Drainage area.--1,260 sq mi.

Water temperature records available.--23 spot observations made at time of discharge measurements during period April 1949 to October 1953.

Extremes.--Discharge 1947-53, 1955-65: Maximum, about 600 cfs Apr. 1, 1965.

Discharge 1947-53: No flow at times.

Water temperatures 1949-53: Maximum observed, 80°F July 6, 1950; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
									27-49	0930	56	18-49	1100	53	18-49	1200	57
									18-50	1030	46	18-51	1000	65	19-52	0900	66
									11-51	1300	43	22-52	1130	60	9-53	1800	66
									4-52	1300	46						
									28-52	1320	68						
									13-53	1730	48						
July			August			September			October			November			December		
8-49	1100	70	8-50	1230	72	15-49	1400	63	23-51	1430	42	4-49	1030	38	8-49	1130	32
6-50	1500	80				10-51	1200	60	25-53	1730	47	16-50	1100	32			
7-53	1500	76															

192. Tongue River at State line, near Decker, Mont. (6-3063)

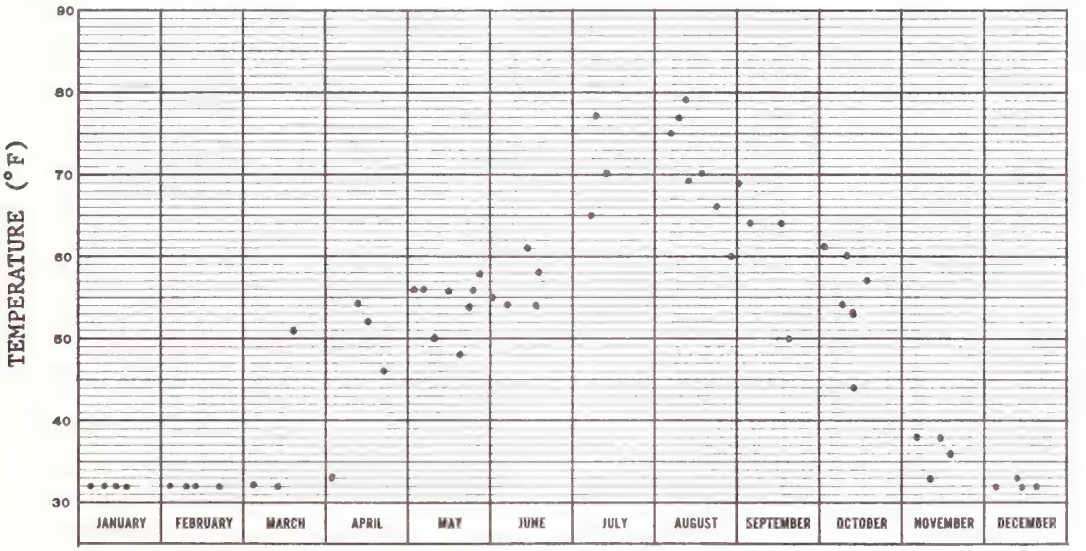
Location.--At gaging station, lat 45°00', long 106°50', in NW¼NE¼ sec.33, T.9 S., R.40 E., on left bank 1 mile north of Montana-Wyoming State line, 1½ miles upstream from Badger Creek, and 1½ miles south of Decker. Altitude of gage is 3,430 ft (from topographic map).

Drainage area.--1,477 sq mi.

Water temperature records available.--58 spot observations made at time of discharge measurements during period August 1960 to December 1965.

Extremes.--Discharge 1960-65: Maximum, 6,080 cfs June 16, 1963; minimum, 3.9 cfs Aug. 23, 1961.

Water temperatures 1960-65: Maximum observed, 79°F Aug. 8, 1963; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1960-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
13-61	1200	32	8-61	1215	32	17-61	1230	51	13-61	1725	52	12-61	1120	56	14-61	1000	61
20-62	1040	32	17-62	1350	32	3-64	1200	32	11-62	1640	54	26-61	0845	58	6-63	1200	54
4-63	0830	32	4-64	1140	32	10-65	1315	32	17-63	0830	46	15-62	1015	48	17-63	1855	58
7-64	1000	32	9-65	1325	32				2-64	1300	33	2-63	1250	56	1-65	1740	55
12-65	0910	32										23-63	1320	56	16-65	1445	54
												7-64	1000	50			
												22-64	1100	54			
												4-65	1715	56			
July			August			September			October			November			December		
12-62	0955	70	24-60	1620	66	20-61	0845	50	8-60	1430	60	18-60	1345	36	14-60	1550	32
9-63	1500	77	9-61	0830	69	18-62	1140	64	10-61	1300	44	14-61	1250	33	14-61	1315	32
8-65	1000	65	7-62	1350	77	4-63	1000	64	11-62	1730	53	16-62	0955	38	11-62	0900	32
			30-62	0950	60	1-64	1625	69	2-63	1115	61	6-63	0945	38	3-63	0940	32
			8-63	1100	79				12-64	1525	57				10-64	0930	33
			12-64	1015	70				6-65	0900	54						
			5-65	1345	75												

193. Tongue River at Tongue River Dam, near Decker, Mont. (6-3075)

Location.--At gaging station, lat 45°08', long 106°46', in NE¼ sec.13, T.8 S., R.40 E., on left bank half a mile downstream from Tongue River Dam, 4 miles upstream from Post Creek, 8 miles northeast of Decker, 16 miles southeast of Kirby, and at mile 162.3. Datum of gage is 3,050.00 ft above mean sea level (Corps of Engineers bench mark). Thermograph is located at Lee footbridge 1½ miles downstream.

Drainage area.--1,770 sq mi.

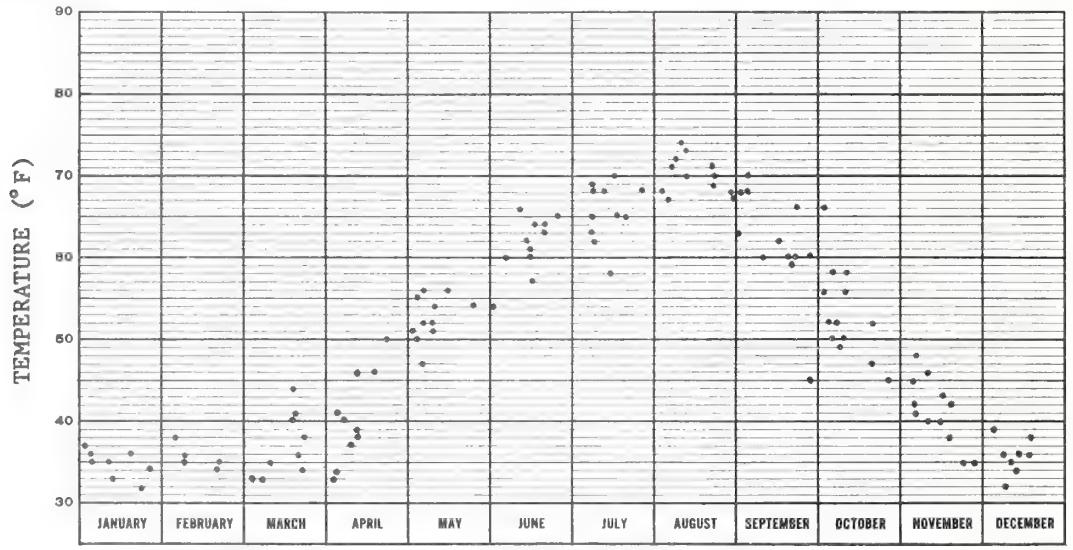
Water temperature records available.--141 spot observations made at time of discharge measurements during period July 1949 to December 1965. Thermograph record during period June to September 1965 published in this report.

Extremes.--Discharge 1939-65: Maximum, 6,180 cfs June 5, 1944; minimum, probably less than 0.5 cfs during period when gates at dam were closed.

Water temperatures 1949-65: Maximum, 75°F Aug. 12, 1965; minimum observed, 32°F Dec. 18, 1950, Jan. 23, 1951.

Remarks.--Water temperatures affected by storage in Tongue River Reservoir. Water is drawn from bottom of reservoir.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1949-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
23-51	1100	32	18-58	1000	35	22-51	0730	34	23-54	0915	50	4-51	0830	55	13-52	1730	66
6-53	1000	35	8-61	1000	35	21-52	0930	36	12-56	1100	38	6-52	0930	56	15-54	1130	60
26-56	1100	34	17-62	0945	34	18-53	0915	40	12-57	0830	39	6-53	0900	52	25-55	1000	65
6-58	1030	36	6-63	1530	38	23-54	0930	38	7-59	1000	40	11-54	1100	54	6-56	1100	60
5-60	1230	36	4-64	1430	38	7-56	1100	33	5-60	1400	41	10-55	1530	52	15-57	1130	61
13-61	0945	33	9-65	1545	36	17-61	1125	44	13-61	1530	46	10-56	1200	51	23-58	1300	65
19-62	1415	36				19-63	1130	36	11-62	1240	37	15-57	1230	56	16-60	0830	64
3-63	1310	37				3-64	1400	33	17-63	1050	46	3-60	1430	50	14-61	1600	62
7-64	1200	36				10-65	0950	35	2-64	1600	33	12-61	0935	54	19-62	0905	64
12-65	1035	35							3-65	1500	34	2-63	1550	51	18-63	0900	63
												23-63	1500	54	1-65	1450	54
												7-64	1400	47	16-65	1650	57
												4-65	1505	50			

193. Tongue River at Tongue River Dam, near Decker, Mont. (6-3075)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
16-49	1900	70	3-49	1800	68	28-49	1030	45	27-49	1030	45	17-50	1200	38	13-49	1000	34
26-50	1500	68	22-50	1100	69	28-49	1200	60	7-53	1730	58	5-51	1030	42	8-50	1155	32
20-51	1600	65	21-51	1030	71	19-50	1015	59	19-54	1200	52	28-51	1000	35	9-52	1130	36
17-52	1000	65	13-52	0830	70	18-51	1200	60	3-55	1600	56	6-52	1100	45	7-53	1515	36
8-54	0900	69	5-53	0930	67	11-52	0900	60	11-56	1000	58	11-53	1100	46	17-54	1530	38
9-57	1130	62	11-54	1000	74	2-53	0830	68	9-57	1100	49	17-54	1130	42	17-57	1130	36
8-60	1400	68	23-56	1100	70	22-54	1230	66	8-58	1330	52	23-55	1030	35	11-59	1200	36
12-62	1215	68	7-57	1000	71	5-57	1030	68	6-59	1300	50	7-56	1130	42	14-60	1300	36
9-63	1700	65	13-58	1030	73	2-59	1400	68	20-60	1635	47	6-57	1000	41	14-61	1045	36
14-64	1530	58	24-60	1330	70	16-60	1700	62	10-61	0935	50	10-59	1230	40	11-62	1130	36
8-65	1330	63	9-61	1100	72	20-61	1005	60	11-62	1620	56	17-60	1140	38	3-63	1200	39
			7-62	1040	71	18-62	1430	60	2-63	1220	66	14-61	1030	40	10-64	1255	35
			30-62	1155	68	4-63	1135	70	12-64	1335	56	16-62	1100	43	7-65	1420	36
			8-63	1230	72	1-64	1415	63	6-65	1115	52	6-63	1520	48			
			31-65	1725	67												

Water temperatures (°F), June to September 1965

Month	Day																												Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
June																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	63	62	61	62	61	62	62	62	62	-	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	62	61	61	60	60	61	62	62	62	-	--
July																																
Maximum.....	--	--	--	--	65	70	66	64	64	65	65	66	67	67	68	68	68	69	67	69	69	67	69	69	69	70	70	71	71	70	71	--
Minimum.....	--	--	--	--	62	63	64	64	64	64	64	64	64	64	64	64	64	65	65	65	65	66	66	65	65	66	66	66	67	67	67	--
August																																
Maximum.....	72	72	70	71	72	72	73	74	74	74	74	75	74	73	73	73	73	74	74	72	71	72	73	72	73	73	71	72	72	70	70	73
Minimum.....	68	68	68	69	69	69	69	69	70	70	70	70	70	70	70	70	70	70	70	71	69	71	70	70	70	69	68	68	67	67	67	69
September																																
Maximum.....	70	71	70	65	67	64	67	67	67	64	63	65	63	65	64	63	62	60	59	60	59	59	58	58	58	59	60	60	--	--	-	--
Minimum.....	67	67	66	64	64	64	64	64	64	62	62	62	62	62	62	62	60	59	58	58	58	58	57	58	58	58	59	60	--	--	-	--

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1965	Max	--	--	--	--	--	--	71	75	71	--	--	--
	Min	--	--	--	--	--	--	62	67	57	--	--	--

194. Tongue River at Miles City, Mont. (6-3085)

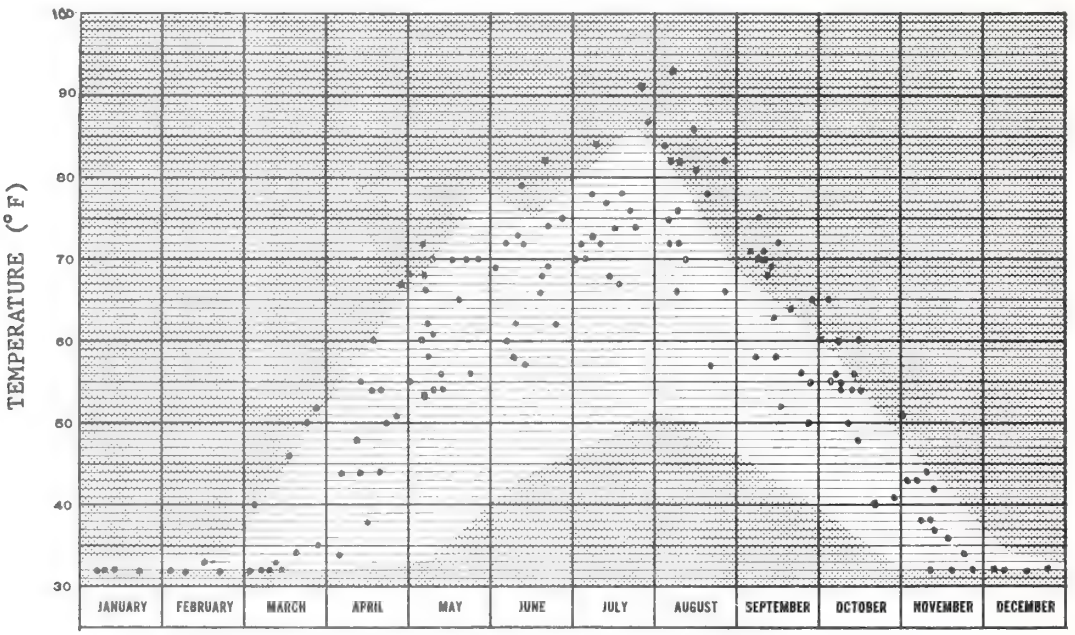
Location.--At gaging station, lat 46°21', long 105°48', in SE¼ sec.23, T.7 N., R.47 E., on right bank 4 miles south of Miles City and 8 miles upstream from mouth. Altitude of gage is 2,370 ft (by barometer).

Drainage area.--5,379 sq mi.

Water temperature records available.--157 spot observations made at time of discharge measurements during period April 1949 to December 1965. Once-daily observations made during period April 1949 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1938-42, 1946-66: Maximum, 13,300 cfs June 15, 1962; no flow July 9-19, Aug. 13, 14, Sept. 28, 1940.

Water temperatures 1949-65: Maximum observed, 93°F Aug. 8, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1949-65.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-61	1450	32	13-61	1750	32	30-52	1630	35	26-49	1600	67	26-49	1600	70	9-49	1130	72
16-62	1700	32	11-63	1600	33	27-53	1200	50	17-50	1530	54	11-50	0950	54	19-49	1100	62
8-63	1350	32	5-64	0930	32	17-54	1500	46	11-51	1000	38	25-50	0830	56	6-50	1420	72
8-64	1455	32	2-65	1600	32	11-55	1430	33	23-51	1400	51	1-51	1745	68	20-50	1440	75
6-65	1530	32				24-56	0930	34	16-54	1600	60	9-51	1430	62	8-51	0845	62
						30-60	1545	52	9-55	1830	55	16-51	1600	70	2-53	1630	69
						10-61	0830	32	18-56	1130	50	7-52	1700	66	17-53	1930	74
						13-62	1600	32	8-57	1600	48	18-53	1600	65	17-54	1610	69
						4-63	1505	40	8-58	0900	44	7-54	1730	72	9-55	1645	57
						2-64	1630	32	17-59	1600	44	6-55	1400	60	8-56	1430	73

194. Tongue River at Miles City, Mont. (6-3085)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						9-65	1230	32	15-60	1500	54	8-56	1630	54	14-57	1545	66
									4-62	1245	44	9-57	1600	58	6-58	0900	60
									3-63	0845	34	19-58	1645	70	15-59	1800	82
												11-59	1800	56	9-61	1800	79
												7-60	1730	68	7-62	1745	58
												8-61	1755	70	15-65	1830	68
												1-62	1220	55			
												8-63	0830	61			
												6-64	1430	53			
July			August			September			October			November			December		
7-49	1600	84	3-49	1500	84	29-49	1430	65	5-49	1500	55	2-49	1500	43	6-49	1600	32
6-50	0800	73	17-50	1030	78	11-50	1435	58	25-49	1000	40	14-50	1700	32	6-60	1200	32
18-50	1430	76	27-51	1600	66	27-50	1410	55	10-50	1600	54	28-51	1130	32	6-61	1545	32
13-51	1500	78	8-52	1430	70	12-51	0930	52	9-51	1530	60	13-52	1100	36	11-62	1400	32
7-53	1100	72	27-53	1430	82	26-51	1500	50	30-51	1630	41	9-53	1300	42	4-63	0930	32
28-53	1530	87	18-54	0915	57	8-52	1530	71	9-52	1630	54	9-56	1300	37	4-64	0950	32
19-54	1645	74	5-55	1330	82	24-53	1630	56	5-55	1130	54	21-57	1530	34	6-65	1225	32
6-55	1830	78	7-57	1630	76	16-54	1200	64	3-56	1530	65	7-58	1600	44	23-65	0915	32
10-56	1600	67	11-58	1800	81	8-55	0900	70	9-57	1730	48	7-60	1545	38			
24-56	1500	91	7-59	1730	82	12-56	1230	72	7-58	0900	54	8-61	1635	32			
8-57	1530	77	4-60	1000	75	11-57	1330	63	6-59	1000	50	7-62	1610	44			
9-58	1000	68	8-61	1600	93	8-58	1300	75	8-60	1900	56	6-63	1030	38			
3-59	1700	72	7-62	0800	66	10-59	1700	69	5-61	1750	60	4-64	1530	43			
7-60	1330	84	7-63	0900	72	9-60	1240	68	1-62	1630	60	1-65	1215	51			
10-61	1700	74	4-64	1830	62	7-61	1715	70	3-63	0830	55						
1-63	1700	70	11-65	1655	86	6-63	1500	71	4-65	1300	56						
4-65	1100	70				17-63	1345	60									
						7-65	1240	58									

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1949	Max	--	--	--	62	78	71	80	83	60	60	47	--
	Min	--	--	--	47	54	59	55	61	46	33	33	32
1950	Max	--	--	--	--	--	71	74	73	66	55	40	32
	Min	32	--	32	--	--	42	58	59	42	40	--	32
1951	Max	--	32	34	58	64	68	78	75	61	57	36	34
	Min	--	32	32	32	48	42	56	58	46	34	32	33
1952	Max	32	33	36	64	65	72	71	71	65	53	44	32
	Min	32	32	32	34	52	60	56	52	40	34	32	32
1953	Max	32	32	50	53	64	75	72	69	62	51	46	32
	Min	32	32	32	33	33	55	59	57	42	35	32	32
1954	Max	33	34	38	54	65	70	86	66	62	50	41	32
	Min	32	32	32	32	33	53	58	52	41	34	32	32
1955	Max	32	32	34	53	67	70	73	71	61	52	39	32
	Min	32	32	32	32	45	54	65	55	40	34	32	32
1956	Max	32	32	41	51	69	72	70	67	65	55	39	32
	Min	32	32	32	35	42	58	58	53	47	34	32	32
1957	Max	32	33	43	57	67	--	75	72	63	60	44	32
	Min	32	32	32	32	48	--	63	58	48	33	32	32
1958	Max	32	32	45	53	67	69	69	72	67	50	38	--
	Min	32	32	32	34	49	54	58	58	41	34	32	32
1959	Max	--	--	--	--	59	73	73	73	64	50	40	32
	Min	32	32	32	--	44	55	56	56	39	34	32	32
1960	Max	32	32	51	52	62	65	69	69	67	56	38	32
	Min	32	32	32	38	45	52	56	50	42	34	32	32
1961	Max	32	32	45	49	63	71	68	69	61	52	34	32
	Min	32	32	32	32	40	57	51	50	39	32	32	32
1962	Max	32	32	32	59	59	71	73	69	60	56	43	32
	Min	32	32	32	32	47	55	61	52	44	36	32	32
1963	Max	--	--	48	55	66	72	78	69	68	57	42	32
	Min	32	32	32	32	48	60	61	60	52	34	32	32
1964	Max	32	32	32	52	68	71	76	72	64	50	45	32
	Min	32	32	32	35	47	55	66	55	45	40	32	32
1965	Max	32	32	32	59	64	68	75	74	58	56	44	32
	Min	32	32	32	32	45	58	61	51	40	42	32	32
Extremes for years 1949-65													
	Max	33	34	51	64	78	75	86	83	67	60	47	34
	Min	32	32	32	32	33	42	51	50	39	32	32	32

195. Yellowstone River at Miles City, Mont. (6-3090)

Location.--At gaging station, lat 46°25', long 105°51', in SW¼NW¼ sec.28, T.8 N., R.47 E., on left bank 350 ft upstream from bridge on State Highway 22 at Miles City, three-quarters of a mile downstream from Tongue River, and at mile 180.8. Datum of gage is 2,330.20 ft above mean sea level (State Highway Department bench mark).

Drainage area.--48,253 sq mi.

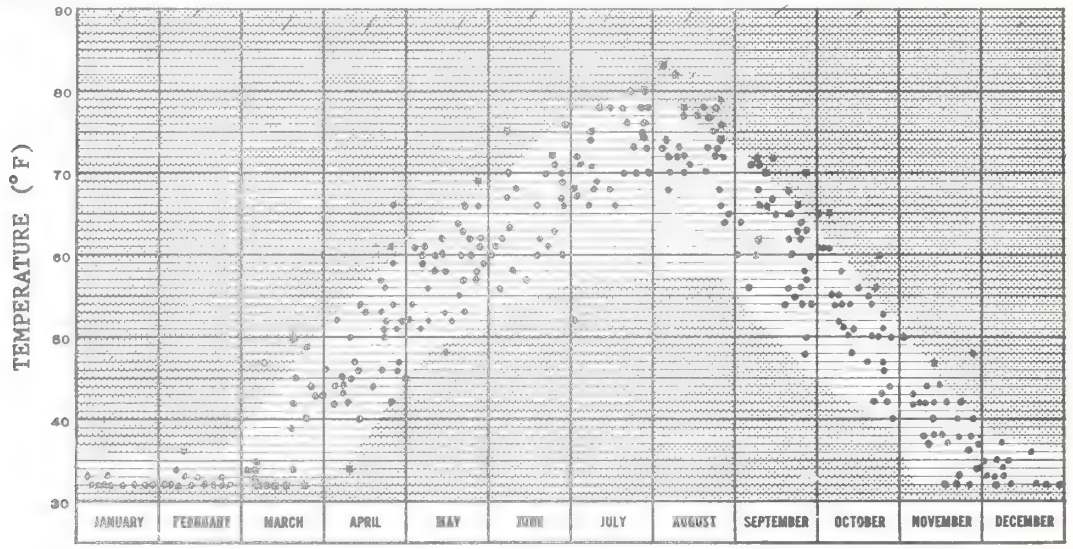
Water temperature records available.--353 spot observations made at time of discharge measurements including 64 observations made at time of water quality sampling during period April 1949 to December 1965. Once-daily observations made during periods December 1940 to December 1947 and January 1960 to December 1965 (some incomplete) at city of Miles City water works published in this report.

Extremes.--Discharge 1922-23, 1928-65: Maximum, 96,300 cfs June 19, 1944; minimum, 996 cfs Dec. 14, 1932.

Water temperatures 1940-65: Maximum observed, 83°F Aug. 4, 1960; minimum, freezing point on many days during winter months.

Remarks.--Temperatures taken at city of Miles City water works at about 8 a. m.

Cooperation.--Once-daily observations furnished by city of Miles City.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1949-47, 1960-65.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-51	1500	32	8-50	1120	32	5-52	0830	32	5-49	1200	42	6-49	1100	59	5-49	1300	67
3-52	0900	33	2-51	0720	32	9-53	1030	32	25-49	1530	59	26-49	0845	62	20-49	1200	60
26-58	1100	32	4-52	1700	34	20-53	1430	45	6-50	1055	54	27-49	1200	62	24-49	0810	66
5-61	0920	32	13-61	1520	32	27-53	1600	49	21-50	1000	50	11-50	0800	52	24-49	1130	66
16-62	1100	32	20-62	1030	32	17-54	1030	39	3-52	0750	42	18-50	1305	63	2-50	0950	58
23-62	1030	32	6-63	1640	36	28-58	1400	44	3-52	1630	44	23-50	1030	62	20-51	1215	63
5-63	1340	32	11-63	1345	33	26-59	0930	40	28-52	1830	66	7-51	0710	60	17-53	1600	66
7-63	1430	33	20-63	[illegible]	33	8-60	1700	47	4-53	0900	45	7-52	1300	58	25-53	1330	66
23-63	1500	32	3-64	1000	34	20-60	1600	50	13-53	1630	44	9-52	0740	53	3-54	1830	56
8-64	1130	32	6-64	0711	33	[illegible]	1510	43	4-54	1130	44	22-52	1800	61	17-54	1340	66

195. Yellowstone River at Miles City, Mont. (6-3090)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
20-64	1530	32	21-64	1130	32	12-62	1515	32	16-54	1330	56	29-52	1230	59	28-54	1410	67
5-65	1400	32	3-65	1445	32	4-63	1410	35	30-54	1330	45	10-53	0930	48	9-55	1300	57
6-65	1210	32	4-65	1735	32	8-63	0730	32	9-55	1600	54	6-54	1630	56	23-55	1530	72
20-65	1230	32	16-65	1355	32	19-63	1000	42	21-55	1830	52	17-54	1530	64	1-56	1500	60
						4-64	1000	33	12-56	1500	50	26-54	1000	58	8-56	1030	70
						4-64	1100	34	18-56	0900	52	6-55	1000	60	21-56	1330	71
						17-64	1500	34	8-57	1400	46	17-55	1715	55	28-56	1130	69
						31-64	1245	43	18-57	1400	46	26-55	0900	57	23-57	1830	60
						2-65	1320	34	25-57	1745	51	8-56	1430	60	25-58	1500	66
						24-65	1050	32	7-58	1800	47	17-56	1330	64	6-59	1500	75
									22-58	1600	51	25-56	1700	69	19-59	1700	70
									28-58	1400	47	9-57	1200	58	23-59	1400	70
									3-59	1500	52	16-57	0945	55	17-60	1430	62
									17-59	1300	42	27-57	0845	60	8-61	1800	68
									27-59	1430	52	8-58	1600	60	29-61	1230	76
									14-60	1630	53	19-58	1400	66	7-62	1525	58
									26-60	1400	44	6-59	1900	52	16-62	1515	60
									10-61	1605	45	26-59	1300	60	8-63	1350	63
									19-61	1400	57	7-60	1530	60	19-63	1630	61
									27-61	1330	46	17-60	1130	60	4-64	0705	62
									4-62	0945	45	27-60	1330	66	2-65	1350	61
									18-62	1615	61	8-61	1555	62	17-65	1330	66
									1-63	1640	46	19-61	1530	57			
									4-63	0630	43	1-62	0945	52			
									15-63	1715	56	2-63	1225	54			
									8-64	1000	40	6-63	1620	61			
									20-64	1600	53	20-63	1430	60			
									6-65	0735	34	5-64	0605	51			
												19-64	1830	53			
												4-65	1850	61			
July			August			September			October			November			December		
7-49	1030	74	18-49	1030	72	5-50	0900	71	6-49	1000	52	3-49	1000	43	6-49	0935	33
18-49	1130	70	7-50	0935	70	27-50	1530	57	22-51	1530	42	28-49	1100	48	1-50	1100	35
6-50	0945	68	16-50	1500	72	28-50	1000	50	30-51	1500	40	3-50	1250	42	6-51	1100	34
6-50	1100	68	28-51	1000	64	11-51	1000	62	9-52	1330	51	27-51	1500	32	6-51	1630	34
18-50	0830	66	6-52	1315	72	18-51	1340	63	20-52	1600	50	12-52	1600	38	7-61	1320	32
18-50	1000	67	7-53	1030	78	21-51	1500	56	6-53	1000	54	20-52	1030	37	28-61	1600	32
27-50	1630	75	18-53	1400	79	26-51	1135	70	15-53	0915	57	9-53	1000	42	7-62	0715	35
18-51	1320	78	28-53	1000	72	27-51	1100	48	26-53	0930	42	19-53	1500	40	18-62	1550	36
3-52	1655	71	17-54	1900	68	9-52	1140	72	8-54	1000	54	27-53	1600	36	2-63	1500	33
6-53	1700	71	27-54	1430	74	18-52	1630	65	18-54	0945	51	8-54	1030	44	5-63	1600	35
27-53	1400	76	5-55	0900	72	28-52	1500	63	25-54	1030	43	23-54	1030	42	20-63	1230	32
7-54	1000	75	16-55	0900	75	9-53	1100	67	5-55	1630	54	8-56	1710	38	4-64	1535	32
19-54	1345	76	23-55	1430	77	17-53	1000	54	14-55	1500	55	22-57	0930	33	6-65	1550	37
29-54	1330	74	7-56	1730	72	24-53	0830	58	28-55	1330	47	7-58	1500	42	22-65	1545	32
7-55	1230	68	29-56	0930	65	7-54	1730	68	3-56	1300	61	12-58	0930	40			

195. Yellowstone River at Miles City, Mont. (6-3090)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
15-55	1430	78	27-57	1830	66	16-54	1000	63	15-56	1500	54	8-59	1400	38			
27-55	1000	75	11-58	1630	77	27-54	0930	64	26-56	1700	46	7-60	1230	38			
23-56	1900	76	20-58	1600	73	7-55	1800	71	9-57	1430	48	9-61	1335	37			
30-56	1400	78	26-58	1230	72	23-55	1000	54	18-57	1530	53	29-61	1220	33			
8-57	1830	69	7-59	1430	77	6-56	1700	60	28-57	1430	42	6-62	1315	44			
29-57	1330	73	13-59	1730	70	12-56	1000	68	6-58	1730	58	7-62	1500	47			
8-58	1900	66	26-59	1700	76	24-56	1400	62	16-58	1600	56	17-62	1130	38			
16-58	1000	66	4-60	1600	83	11-57	0930	62	28-58	1430	44	4-63	1600	42			
26-58	1300	70	19-60	0900	72	27-57	1100	60	21-59	1600	46	7-63	0640	42			
28-59	1430	78	8-61	1300	82	8-58	1730	70	27-59	1400	47	21-63	1530	32			
20-60	0900	80	23-61	1710	78	18-58	1730	60	16-60	1500	50	5-64	0630	42			
28-60	1200	80	6-62	1640	73	26-58	1300	56	5-61	1515	55	1-65	1245	50			
10-61	1500	78	21-62	0850	72	10-59	1430	65	18-61	1115	47	1-65	1340	50			
18-61	1530	78	5-63	1600	70	18-59	1530	54	1-62	1455	61	17-65	1100	32			
28-61	0800	74	8-63	1430	71	25-59	1700	58	2-62	1520	61	30-65	1515	34			
2-62	1440	72	19-63	1430	78	8-60	1525	66	15-62	1520	50						
23-62	1500	70	5-64	1430	68	20-60	1600	68	1-63	1530	65						
1-63	0545	52	4-65	1115	74	27-60	1730	58	3-63	1700	65						
1-63	1430	68	12-65	1100	78	7-61	1535	66	17-63	1500	60						
22-63	0545	52				21-61	1520	55	8-64	0800	50						
2-64	0805	67				5-63	1625	56	4-65	1445	55						
15-64	1000	68				6-63	1115	72	6-65	0815	51						
27-64	1330	74				16-63	1500	66	18-65	1610	51						
						2-64	1700	64									
						1-65	0830	60									
						8-65	1550	66									

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1940	Max	--	--	--	--	--	--	--	--	--	--	--	33
	Min	--	--	--	--	--	--	--	--	--	--	--	33
1941	Max	33	34	46	58	66	76	80	78	65	48	42	--
	Min	32	33	34	46	--	58	76	--	49	39	32	32
1942	Max	33	--	38	--	66	65	75	--	70	58	--	--
	Min	32	33	33	--	50	54	63	--	50	38	--	32
1943	Max	--	--	--	--	--	--	75	75	70	60	43	38
	Min	--	--	--	--	--	--	--	68	54	42	32	32
1944	Max	36	34	38	55	66	68	76	75	65	55	50	36
	Min	32	32	33	38	47	58	65	63	54	45	33	33
1945	Max	34	34	48	54	65	70	75	74	68	54	44	35
	Min	33	33	33	38	48	54	56	63	48	43	33	33
1946	Max	35	36	47	60	65	68	78	78	66	57	38	36
	Min	33	33	34	48	52	58	68	62	52	38	32	32
1947	Max	35	34	42	58	60	65	75	76	69	56	44	33
	Min	32	33	33	40	56	55	60	66	52	45	33	32
1960	Max	36	35	51	56	64	69	79	78	72	57	46	35
	Min	33	32	33	44	48	60	69	61	53	44	33	33
1961	Max	34	35	49	53	68	77	75	75	70	54	40	33
	Min	32	33	33	42	48	63	68	69	48	38	32	33
1962	Max	35	33	35	60	62	68	72	73	63	58	49	37
	Min	33	33	33	36	52	55	67	60	53	46	37	33
1963	Max	34	34	50	55	63	68	75	77	70	63	45	36
	Min	33	33	33	41	52	59	66	68	61	44	33	33
1964	Max	35	34	35	56	67	69	76	76	64	55	48	35
	Min	33	32	33	40	53	56	66	58	53	45	33	33
1965	Max	34	33	39	58	60	65	76	76	63	58	48	36
	Min	33	33	33	33	48	59	63	60	45	47	33	33
Extremes for years 1940-47, 1960-65													
	Max	36	36	51	60	68	77	80	78	72	63	50	38
	Min	32	32	33	33	47	54	56	58	45	38	32	32

195. Yellowstone River at Miles City, Mont. (6-3090)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), December 1940																																
December.....	--	33	33	33	33	--	--	--	--	--	--	33	--	--	--	--	33	33	33	33	33	33	33	33	33	33	33	33	--	33	--	--
Water temperatures (°F), calendar year 1941																																
January.....	--	--	32	32	--	--	--	--	--	33	33	33	33	33	33	33	33	33	33	--	33	--	33	--	--	--	--	--	--	--	--	--
February.....	--	--	33	33	33	33	33	33	--	33	33	33	34	34	--	--	--	--	--	--	--	33	--	--	--	--	--	--	33	33	-	--
March.....	34	34	34	34	--	35	35	35	35	36	--	--	--	--	--	--	--	--	--	--	--	--	34	34	35	35	35	35	36	--	46	--
April.....	46	46	46	--	--	--	--	--	--	--	--	--	--	--	--	48	52	54	54	54	55	48	--	54	58	56	58	58	--	--	-	--
May.....	--	--	--	--	--	--	--	--	--	60	62	64	65	65	66	62	62	64	60	60	62	--	--	--	--	--	--	--	--	--	--	--
June.....	--	--	65	65	66	63	65	65	58	58	60	62	62	62	--	65	--	--	--	--	--	--	--	--	--	--	--	75	76	76	-	--
July.....	76	76	76	78	78	78	78	78	--	--	--	--	--	--	--	77	77	--	78	77	78	80	80	80	80	80	80	76	76	76	--	--
August.....	76	--	74	--	--	--	--	--	--	--	77	77	77	75	78	78	76	78	76	76	--	70	70	68	68	--	--	--	--	--	--	--
September....	--	--	--	65	--	--	--	55	52	50	52	50	58	58	56	58	58	58	--	--	--	--	--	--	--	52	51	50	49	49	-	--
October.....	48	48	48	47	47	46	46	46	46	46	46	46	--	--	--	--	--	44	--	--	--	--	--	--	46	46	46	45	45	43	39	--
November.....	39	39	39	39	42	--	--	--	--	--	--	--	--	--	--	--	--	40	39	36	36	32	32	32	32	34	34	34	34	34	-	--
December.....	--	--	--	--	--	--	--	--	--	--	--	34	33	33	33	34	34	34	34	34	34	34	34	33	--	--	--	32	--	--	--	--
Water temperatures (°F), calendar year 1942																																
January.....	--	--	--	--	32	32	32	32	32	33	32	32	32	32	32	32	--	--	--	--	--	--	--	--	--	--	--	--	33	33	33	--
February.....	33	33	33	34	34	34	34	34	34	--	--	--	--	--	--	--	--	--	--	--	--	34	33	33	33	33	33	33	-	-	-	--
March.....	33	33	34	34	34	--	--	--	--	--	--	--	--	--	--	--	--	34	34	35	35	36	36	38	38	35	35	36	36	--	--	--
April.....	--	--	--	--	--	--	--	--	--	--	--	48	50	50	50	52	54	54	54	54	55	55	--	--	--	--	--	--	52	52	-	--
May.....	--	52	52	50	52	52	53	54	55	55	55	56	56	56	56	50	--	--	--	--	--	--	--	--	--	66	66	65	62	62	52	53	--
June.....	54	54	54	54	62	64	64	64	64	--	--	--	--	--	--	--	--	60	60	62	62	64	65	65	65	65	65	62	62	63	-	--
July.....	63	65	68	65	67	--	--	--	--	--	72	70	71	--	75	73	75	75	73	73	75	75	75	75	75	75	75	--	--	--	--	--
August.....																																
September....	--	70	70	70	70	--	--	70	70	70	66	65	64	--	--	--	--	--	--	--	--	--	--	--	--	--	60	50	50	50	-	--
October.....	50	58	53	53	53	53	53	--	--	--	--	--	--	--	--	--	--	--	--	--	50	50	48	46	40	38	38	38	38	38	38	--
November.....																																
December.....	32	--	32	--	--	--	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	--	--	--	--	--	--	32	--
Water temperatures (°F), July to December 1943																																
July.....	--	--	--	--	--	65	65	69	70	70	70	70	70	70	72	72	72	72	72	72	72	74	74	73	74	74	74	74	72	75	74	--
August.....	75	71	67	69	--	--	--	--	--	--	74	74	74	74	70	70	69	70	70	70	70	70	70	70	68	68	68	70	70	70	70	--
September....	70	--	--	62	60	--	56	56	55	56	59	60	60	58	56	56	56	58	54	55	56	56	55	56	56	56	57	60	62	61	-	58
October.....	60	--	57	57	--	57	--	50	56	54	54	54	54	54	50	50	50	50	50	47	43	--	42	44	44	44	44	43	44	46	43	50
November.....	40	37	37	37	38	37	39	38	38	38	43	38	38	38	38	38	38	38	36	37	38	38	38	37	33	32	32	32	32	32	-	37
December.....	32	32	34	36	38	35	34	35	35	33	33	33	33	32	32	33	33	33	33	33	33	33	33	32	32	32	32	32	32	32	32	33

195. Yellowstone River at Miles City, Mont. (6-3090)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1944																																
January.....	32	32	32	32	32	33	33	33	32	32	32	32	32	32	32	34	34	34	34	35	35	35	36	34	33	33	33	33	33	33	33	33
February.....	33	33	33	33	33	33	33	33	33	33	32	32	32	33	34	34	33	33	33	33	33	33	33	33	33	34	33	33	33	-	-	33
March.....	33	33	33	33	33	33	34	34	35	36	36	36	35	33	33	33	33	34	34	--	--	35	35	34	34	34	34	34	34	36	38	34
April.....	38	38	38	40	40	50	50	52	52	46	45	46	48	47	49	49	48	48	48	48	46	46	50	50	50	50	50	50	55	55	-	47
May.....	53	51	47	47	--	--	50	--	--	--	56	56	58	58	60	60	62	64	64	58	58	58	56	58	56	58	60	64	64	64	66	58
June.....	68	68	64	65	60	60	60	60	60	60	60	60	60	60	60	60	60	58	60	62	62	62	62	64	64	64	64	--	61	63	-	62
July.....	65	67	67	66	66	67	68	68	68	66	68	68	68	70	70	70	72	72	72	72	72	72	72	74	74	74	75	75	75	76	76	70
August.....	74	74	72	72	72	74	74	75	75	75	72	72	70	70	65	63	64	66	--	66	64	66	66	67	--	65	64	66	64	64	64	69
September....	64	64	64	63	63	63	63	63	63	65	63	63	63	65	63	62	58	56	55	55	54	55	55	55	55	58	58	56	56	56	-	60
October.....	55	47	45	50	52	50	48	48	50	48	47	47	48	47	48	48	48	48	48	48	48	48	48	48	48	48	49	49	50	50	50	49
November.....	50	43	40	39	37	38	41	41	42	42	42	42	42	36	38	36	36	33	33	33	33	33	33	33	33	33	33	33	33	33	-	37
December.....	33	33	33	33	33	33	35	36	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Water temperatures (°F), calendar year 1945																																
January.....	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	34	33	33
February.....	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	33	33	33	33	33	-	-	-	33
March.....	33	33	34	33	34	33	33	33	34	34	34	34	34	36	36	34	34	38	38	36	36	36	38	38	40	42	44	44	46	45	48	37
April.....	44	44	42	38	42	44	43	45	45	45	45	45	48	48	46	46	42	38	46	46	48	50	48	50	50	50	54	54	53	53	-	46
May.....	54	54	54	54	56	56	56	50	50	48	52	54	55	50	48	48	49	50	58	56	55	57	56	60	60	63	63	60	62	64	65	55
June.....	63	63	63	60	57	56	54	55	56	56	58	58	60	58	58	58	58	58	60	60	65	68	70	68	68	65	65	64	56	56	-	60
July.....	56	59	60	62	62	63	64	66	68	66	66	68	68	68	70	70	70	70	70	70	74	74	74	74	74	74	74	74	74	75	73	69
August.....	73	71	72	72	72	70	68	68	74	74	74	74	73	70	70	70	73	73	70	68	63	63	64	65	65	66	66	66	66	67	67	69
September....	68	66	68	68	68	68	66	63	63	60	59	58	58	58	58	58	58	55	54	50	52	52	50	50	50	52	50	50	48	48	-	58
October.....	54	52	52	52	54	54	54	48	48	48	52	48	52	52	52	53	52	52	51	50	46	46	46	45	45	45	43	43	43	43	45	49
November.....	44	42	40	42	44	42	41	36	33	33	33	33	--	34	35	36	37	37	36	36	35	33	33	34	33	33	33	34	34	34	-	36
December.....	34	33	33	33	33	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	34	35	33
Water temperatures (°F), calendar year 1946																																
January.....	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	33	33	33	34	34	35	34
February.....	34	34	34	34	34	34	34	34	34	34	33	33	33	33	33	33	36	36	35	34	34	34	36	36	36	36	36	36	-	-	-	34
March.....	35	35	35	34	35	35	35	34	34	35	36	37	40	40	40	40	40	40	43	43	43	45	45	45	40	40	46	47	46	46	47	40
April.....	49	48	48	48	48	50	52	48	48	50	50	54	54	56	56	56	56	58	58	59	60	60	60	58	58	58	59	60	60	60	-	55
May.....	58	56	54	54	58	56	56	58	58	56	56	52	54	52	54	54	55	56	56	54	56	57	57	58	58	60	62	65	64	61	61	57
June.....	58	58	58	64	68	68	65	63	65	65	64	65	63	64	65	66	65	62	60	61	64	64	64	66	64	64	64	64	66	67	-	64
July.....	68	70	72	74	72	75	74	74	72	70	68	70	74	72	75	75	75	75	75	75	75	75	75	72	72	74	72	74	75	75	78	73
August.....	78	78	76	70	70	72	71	68	68	66	68	68	70	70	68	68	68	68	68	68	72	72	72	72	68	66	64	62	62	62	64	69
September....	64	66	65	65	65	65	64	60	58	55	54	56	60	60	60	64	62	60	58	58	58	56	54	54	58	58	54	53	52	53	-	59
October.....	55	57	57	54	50	45	44	41	43	45	44	42	44	44	44	42	42	42	42	42	42	46	46	46	46	46	41	40	40	40	38	45
November.....	38	37	35	35	35	34	35	34	36	36	36	35	35	37	36	35	35	35	34	33	33	32	32	32	32	32	32	32	32	32	-	34
December.....	32	32	33	33	33	33	33	33	34	35	36	36	34	33	33	33	33	33	33	33	33	33	33	33	34	33	33	33	32	32	32	33

195. Yellowstone River at Miles City, Mont. (6-3090)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1947																																
January	32	32	32	32	32	32	32	32	32	33	33	33	33	33	33	33	33	34	33	33	33	33	34	34	35	35	35	35	35	35	33	33
February	33	33	33	33	33	34	33	33	33	33	33	33	34	33	34	33	34	34	34	34	34	34	34	33	33	33	33	33	-	-	-	33
March	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	36	34	36	33	33	33	33	33	33	36	38	40	40	40	42	35
April	44	44	44	42	42	40	40	40	40	46	48	48	48	46	46	46	48	50	52	54	54	50	48	50	48	50	54	57	58	58	-	48
May	56	56	58	58	60	60	58	58	58	60	60	56	57	57	57	57	57	57	58	58	58	56	56	58	60	60	60	60	56	56	57	58
June	57	59	59	64	63	62	61	62	63	60	62	60	58	61	62	63	63	64	65	65	63	63	55	60	59	63	63	62	60	58	-	61
July	60	62	67	68	70	71	72	72	73	73	73	72	71	72	72	72	70	72	72	72	72	73	73	73	75	75	73	74	75	75	75	72
August	75	75	75	76	74	74	74	73	74	73	70	70	68	66	68	70	70	72	72	70	70	70	70	70	70	68	68	68	68	69	68	71
September	68	68	69	68	68	67	65	64	64	64	63	62	62	55	55	55	53	53	52	52	52	52	52	56	56	57	57	58	56	54	-	59
October	53	54	54	56	56	56	54	54	52	53	53	50	50	54	54	56	56	56	56	53	52	50	48	48	48	45	45	45	45	50	48	52
November	44	44	44	42	40	37	--	37	37	37	37	37	36	35	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	-	36
December	33	33	33	32	32	32	33	33	33	33	33	33	33	33	--	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33
Water temperatures (° F), calendar year 1960																																
January	36	36	34	34	34	34	35	35	34	33	33	33	33	33	34	36	34	34	34	--	34	34	34	--	34	34	34	34	35	35	36	34
February	35	33	33	33	33	33	33	34	34	33	34	34	34	34	34	33	33	33	34	34	34	34	34	34	34	32	33	33	33	-	-	34
March	33	33	33	33	33	33	34	34	33	33	33	33	33	33	34	34	34	35	38	38	35	35	35	35	39	45	49	51	51	51	51	37
April	49	48	49	49	50	52	53	56	52	53	52	54	54	56	51	50	49	50	52	52	53	53	50	48	45	44	45	44	44	44	-	50
May	48	50	50	51	51	53	54	58	59	60	62	64	64	62	63	61	60	58	57	56	58	58	60	63	63	64	63	62	63	63	63	59
June	65	66	67	65	63	62	61	63	64	60	63	63	63	64	63	63	64	64	65	65	64	60	60	62	64	66	67	69	69	69	-	64
July	70	72	71	70	69	70	71	73	75	75	75	76	76	76	76	76	76	76	76	76	79	78	75	75	75	75	75	75	76	74	74	74
August	76	77	78	76	76	76	74	75	75	74	74	72	73	73	70	70	70	68	69	70	70	70	66	64	62	61	62	61	61	64	63	70
September	63	66	67	67	72	70	67	62	61	62	63	63	63	63	65	62	59	58	60	61	58	56	57	56	56	57	56	55	54	53	-	61
October	54	54	54	55	56	56	56	57	55	53	52	51	51	49	46	47	45	45	46	45	45	47	47	49	50	50	49	49	47	44	44	50
November	46	42	--	40	38	39	40	38	33	34	34	34	34	35	36	36	36	36	36	36	37	36	37	37	37	36	36	33	33	33	-	36
December	33	33	33	34	34	33	33	35	34	33	33	33	33	33	33	33	33	33	33	33	33	33	34	33	33	33	34	34	34	34	35	33
Water temperatures (°F), calendar year 1961																																
January	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	32	33	33	33	33	33
February	33	33	35	33	33	35	35	33	33	33	33	33	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	-	-	-	33
March	33	33	33	33	33	33	33	33	33	38	38	38	40	40	42	43	45	46	49	46	46	46	47	48	49	47	45	43	41	45	43	41
April	45	47	48	47	47	43	42	43	46	47	45	49	50	45	44	46	47	49	52	53	50	52	49	45	44	45	45	46	46	50	-	47
May	48	52	53	52	49	52	54	54	56	59	60	56	59	58	60	58	53	52	54	57	62	64	62	66	66	66	66	67	68	68	65	59
June	63	63	64	64	65	67	67	67	67	67	67	66	65	65	65	65	68	68	69	70	71	69	68	68	69	72	74	75	77	74	-	68
July	73	74	73	73	73	70	72	70	72	73	71	70	69	68	70	72	74	73	74	72	72	71	72	75	75	73	74	75	73	71	72	72
August	70	75	74	74	75	75	75	74	74	69	69	69	71	73	75	75	75	75	72	73	74	74	74	75	75	74	72	75	75	74	74	73
September	70	62	56	60	60	63	62	63	65	61	59	53	53	53	53	54	56	60	58	56	57	55	51	49	49	50	49	49	50	48	-	56
October	47	49	49	52	53	54	52	49	47	47	47	46	46	45	49	52	53	51	49	49	48	48	43	43	41	41	42	44	40	38	39	47
November	40	37	34	34	34	33	32	34	33	33	38	40	38	38	38	35	34	35	34	34	34	34	33	33	33	33	33	33	33	32	-	35
December	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33

195. Yellowstone River at Miles City, Mont. (6-3090)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1962																																
January	33	33	33	33	34	35	34	33	33	33	33	33	33	33	33	--	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33
February	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	-	-	-	33
March	33	33	33	33	34	35	34	33	33	33	33	33	33	33	33	34	34	34	34	33	33	33	34	34	34	34	34	35	35	35	35	34
April	36	38	42	44	47	46	48	45	48	46	45	45	45	48	50	52	55	56	57	59	58	50	55	56	60	60	58	57	54	52	-	50
May	52	53	55	58	60	58	58	58	57	58	59	61	60	58	57	56	58	58	60	62	62	61	56	58	58	55	54	54	56	56	57	58
June	60	62	64	65	60	57	55	57	60	60	64	67	68	68	65	63	60	61	63	64	65	64	64	64	65	66	68	68	68	68	-	63
July	69	70	67	69	70	68	69	69	70	70	70	71	71	70	67	67	69	69	70	70	71	71	72	72	72	71	72	72	71	68	70	70
August	70	72	72	71	71	71	70	70	71	72	69	69	70	72	72	70	71	73	72	70	70	71	67	64	66	67	68	65	62	60	60	69
September	62	63	61	57	57	59	61	59	53	54	56	57	56	56	56	57	60	59	61	60	61	61	60	62	61	61	61	62	62	57	-	59
October	57	56	56	57	58	58	57	57	57	55	54	54	53	53	52	50	50	51	52	51	52	53	50	49	47	47	48	46	48	49	49	52
November	45	49	48	49	48	48	45	44	44	43	42	44	44	43	42	41	40	38	38	41	40	39	38	38	38	38	37	38	39	38	-	42
December	37	36	36	35	33	35	35	35	34	34	33	33	33	33	34	34	36	34	37	37	37	34	33	33	33	33	33	33	33	34	34	34
Water temperatures (°F), calendar year 1963																																
January	34	33	33	33	33	33	33	34	34	33	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
February	34	33	33	33	34	34	34	33	33	33	33	33	33	33	33	34	33	33	33	33	33	33	33	33	33	33	33	34	-	-	-	33
March	34	34	35	34	33	33	33	33	33	37	40	40	37	36	38	37	37	38	41	41	42	46	48	37	38	38	48	50	48	49	50	39
April	47	45	41	44	47	48	50	51	49	47	45	45	48	51	55	52	48	48	46	48	45	43	43	46	48	52	54	52	52	52	-	48
May	54	52	54	54	55	56	59	60	60	58	57	55	55	56	58	61	61	61	59	59	58	56	56	61	63	63	62	50	61	62	63	58
June	65	63	62	60	62	60	60	60	61	62	60	59	62	66	66	65	63	63	64	65	66	64	63	62	62	64	66	66	68	68	-	63
July	66	66	66	70	72	71	73	73	73	74	73	71	70	70	70	70	70	71	70	70	71	72	72	75	75	73	70	70	71	73	74	71
August	73	72	71	72	73	72	74	75	75	76	76	75	74	72	77	75	75	75	73	73	72	71	70	70	70	72	72	70	69	68	68	73
September	68	66	68	67	68	68	68	68	69	68	70	70	69	68	64	63	62	61	64	64	62	61	62	63	63	62	62	62	61	61	-	65
October	63	62	62	61	62	62	62	60	60	59	58	58	58	58	58	57	56	56	55	55	54	53	54	53	52	52	52	50	44	45	44	56
November	43	42	41	41	42	41	44	45	45	43	43	41	40	39	40	42	42	40	40	40	38	33	33	33	33	33	36	35	35	34	-	39
December	36	35	35	33	33	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	35	34	33	33	33	33	33
Water temperatures (°F), calendar year 1964																																
January	33	33	35	34	34	34	34	33	33	33	33	33	33	33	33	33	33	34	33	33	33	33	33	33	33	33	33	33	33	34	33	33
February	33	33	33	33	33	33	33	33	33	33	34	34	33	33	33	33	33	33	33	33	33	33	32	32	32	33	33	33	33	-	-	33
March	33	33	33	33	33	33	34	34	33	33	33	33	33	33	34	33	33	34	34	35	33	34	33	33	33	33	33	33	33	34	35	33
April	40	44	45	45	46	44	45	44	45	49	43	44	46	47	49	51	47	47	49	54	55	56	53	54	55	54	54	52	52	52	-	49
May	54	55	56	54	57	57	58	53	53	55	57	55	57	60	60	60	65	66	66	67	66	65	62	61	61	61	60	58	56	55	56	59
June	56	57	59	62	63	64	64	63	59	57	57	58	58	58	64	65	65	63	57	59	58	61	59	62	65	68	69	69	66	65	-	62
July	66	66	68	70	69	70	69	70	71	71	72	72	72	73	73	73	72	73	73	74	74	76	76	73	73	73	73	73	72	72	74	72
August	75	72	74	74	74	72	70	70	75	76	73	68	68	68	70	71	72	74	73	64	62	58	62	61	60	63	63	63	64	60	60	68
September	64	62	60	62	61	60	59	59	60	59	58	57	58	60	59	59	61	62	60	61	60	60	58	58	59	58	58	56	53	55	-	59
October	55	51	52	51	50	50	51	52	52	53	52	53	54	54	54	54	53	52	52	50	52	50	48	48	48	47	46	46	45	46	47	51
November	47	48	48	45	45	44	44	44	43	43	42	43	38	37	36	34	34	34	33	33	33	33	33	33	33	33	34	34	34	33	33	38
December	33	33	33	34	34	34	33	34	35	35	34	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	34	33	33	33	33

195. Yellowstone River at Miles City, Mont. (6-3090)

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures (°F), calendar year 1965																															
January.....	33	33	33	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
February.....	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	-	-	-	33
March.....	33	33	35	36	34	39	33	33	33	33	33	33	33	36	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
April.....	33	33	34	33	33	33	36	40	47	49	48	44	46	46	47	47	48	46	47	49	50	52	53	50	52	52	51	52	56	58	-	46
May.....	60	60	58	56	57	54	50	48	50	54	54	55	57	60	60	60	60	57	58	60	58	57	55	54	52	52	51	53	56	60	58	56
June.....	60	62	62	62	62	62	61	59	59	60	61	63	64	61	61	61	61	61	62	62	63	63	62	64	65	64	61	60	61	62	-	62
July.....	63	65	66	66	66	65	66	66	68	68	68	68	67	68	68	69	71	71	73	73	73	73	71	70	70	71	76	71	74	73	72	69
August.....	70	69	72	72	71	72	69	70	71	72	73	75	76	73	71	71	70	70	69	68	68	67	66	67	66	66	63	63	62	61	60	69
September....	59	62	63	60	57	58	58	59	60	60	59	57	56	57	57	56	49	49	49	50	49	49	47	48	50	50	50	46	45	55	-	54
October.....	58	58	51	53	53	54	54	53	54	52	52	52	54	54	54	55	53	50	49	48	48	48	49	49	48	47	47	48	47	49	48	51
November.....	47	47	46	45	46	48	48	46	45	45	40	38	37	37	37	36	38	37	38	37	36	39	38	38	35	34	33	36	34	34	-	40
December.....	34	34	35	35	35	36	35	35	34	34	35	34	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34

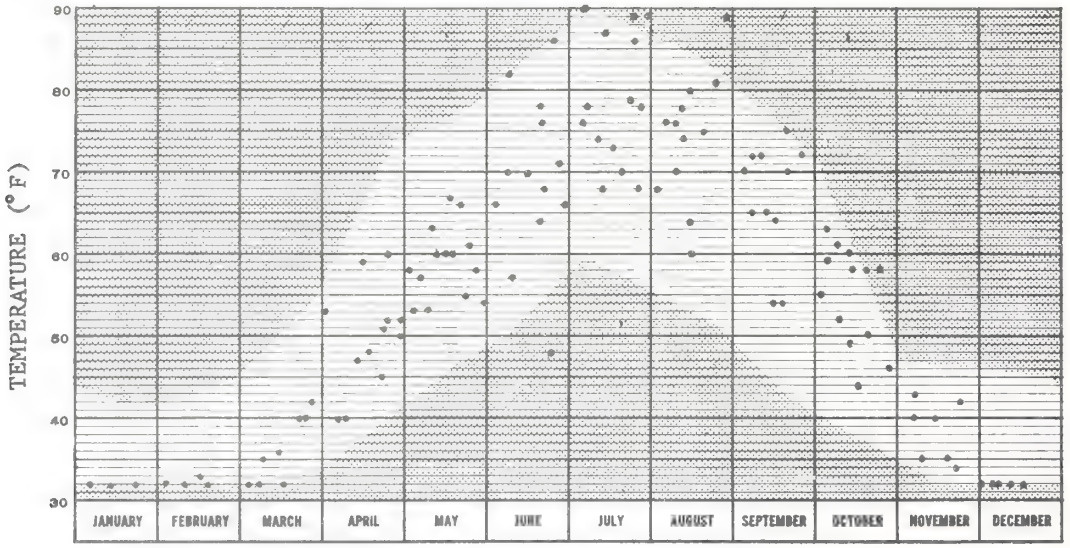
196. Powder River at Moorhead, Mont. (6-3245)

Location.--At gaging station, lat 45°04', long 105°51', in sec.8, T.9 S., R.48 E., on left bank 500 ft downstream from discontinued post office at Moorhead, 6½ miles upstream from Buffalo Creek, and at mile 184.8. Datum of gage is 3,334.6 ft above mean sea level, datum of 1929.

Drainage area.--8,088 sq mi.

Water temperature records available.--114 spot observations made at time of discharge measurements during period May 1949 to December 1965. Once-daily observations during periods February 1951 to September 1953 (incomplete), October 1955 to September 1957 published in reports of the Geological Survey.

Extremes.--Discharge 1929-65: Maximum, 23,000 cfs June 17, 1962; no flow at times.
Water temperatures 1949-65: Maximum observed, 90°F July 7, 1951; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1951-53, 1955-57.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
18-62	0935	32	15-62	1210	32	24-53	1200	40	19-50	1230	45	25-49	1200	54	28-49	1000	66
10-63	1230	32	14-63	1015	33	27-56	1500	42	21-53	1030	51	16-50	1600	66	19-53	1600	76
5-65	1220	32	6-64	1100	32	25-58	1000	40	23-54	1600	60	20-53	1200	58	23-54	1600	86
			2-65	1015	32	15-61	1445	36	22-55	1000	52	13-54	1430	67	24-55	0940	71
						15-62	1400	32	26-56	1030	52	18-55	1300	61	6-56	1730	70
						6-63	1200	35	26-57	1000	50	16-57	1600	55	10-59	1700	70
						5-64	1030	32	1-59	1630	53	9-58	1100	60	6-60	1600	82
						3-65	0950	32	11-60	1500	59	12-59	1800	60	19-61	1835	78
									13-61	1010	48	2-60	1530	58	7-62	0900	57
									10-62	1545	47	11-61	1010	60	19-62	1700	68
									4-63	0930	40	3-62	1030	53	24-64	1200	48
									5-65	1055	40	8-63	1515	63	3-65	1125	66
												6-64	1900	53	17-65	1350	64
												5-65	1320	57			

196. Powder River at Moorhead, Mont. (6-3245)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
20-49	1000	68	2-49	0900	68	13-51	1330	54	2-49	1100	55	18-52	1600	35	5-49	1330	32
23-51	1330	78	11-53	1030	64	10-52	1000	65	10-51	1300	60	10-53	1000	35	12-62	1335	32
7-54	1900	78	10-54	1830	74	27-54	1450	72	7-53	1530	61	22-54	1500	42	4-63	1330	32
25-55	1330	89	30-54	1430	89	7-56	1700	72	19-54	1500	58	20-57	1500	34	1-64	1650	32
25-56	1130	86	24-55	1600	81	12-57	0930	54	4-55	1100	59	7-60	1430	40	7-65	1010	32
9-58	1900	74	8-56	1630	70	16-58	1700	70	27-55	1400	46	15-62	1330	40			
6-59	1600	76	12-58	1600	80	8-59	1600	72	16-56	1600	58	7-63	1100	43			
11-60	1330	87	6-59	1200	76	12-62	1500	64	8-58	1000	52						
19-61	1730	79	8-63	0930	76	4-63	1830	70	12-59	1100	44						
16-62	1820	70	11-64	1130	60	16-64	1540	75	11-60	1800	58						
10-63	1130	68	18-64	1830	75	7-65	1520	65	10-61	1900	49						
13-65	1805	73	10-65	1315	78				16-62	1515	50						
									4-63	1000	63						

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1951	Max	--	36	34	63	78	84	90	83	73	64	45	38
	Min	--	32	32	--	58	50	60	68	53	35	32	32
1952	Max	38	38	38	74	70	82	84	81	80	65	47	38
	Min	32	32	32	34	57	63	68	65	60	45	33	32
1953	Max	39	--	55	63	75	83	87	84	77	--	--	--
	Min	32	--	33	40	50	55	73	65	--	--	--	--
1955	Max	--	--	--	--	--	--	--	--	--	67	46	39
	Min	--	--	--	--	--	--	--	--	--	43	32	32
1956	Max	41	45	46	59	77	81	83	80	79	71	45	45
	Min	32	33	33	40	50	60	60	59	59	42	32	32
1957	Max	36	36	55	66	72	75	85	81	74	--	--	--
	Min	32	32	33	39	47	50	66	51	43	--	--	--
Extremes for years 1951-53, 1955-57													
	Max	41	45	55	74	78	84	90	84	80	71	47	45
	Min	32	32	32	34	47	50	60	51	43	35	32	32

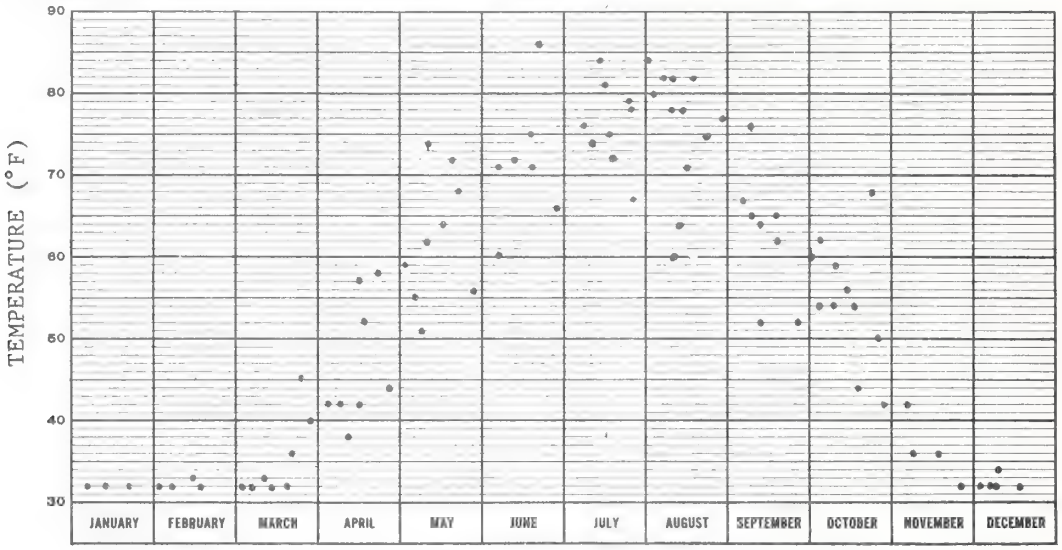
197. Little Powder River near Broadus, Mont. (6-3255)

Location.--At gaging station, lat 45°23', long 105°18', in NW¼NE¼ sec.21, T.5 S., R.52 E., on left bank 1 mile downstream from East Fork, 5 miles upstream from mouth, and 5½ miles southeast of Broadus. Altitude of gage is 3,020 ft (by barometer).

Drainage area.--1,974 sq mi.

Water temperature records available.--89 spot observations made at time of discharge measurements during periods May 1949 to September 1953, July 1957 to December 1965.

Extremes.--Discharge 1947-53, 1955-65: Maximum, 2,340 cfs June 15, 1953; no flow at times.
Water temperatures 1949-53, 1957-65: Maximum observed, 86°F June 20, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1957-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
19-62	0910	32	15-62	1710	32	9-53	1530	32	3-52	1050	42	24-49	1730	56	27-49	1600	66
10-63	0830	32	13-63	1135	33	27-53	0830	40	21-53	1430	58	17-50	1630	72	18-53	1300	75
5-65	1530	32	5-64	1500	32	25-58	1230	45	25-58	1700	44	19-53	1630	68	10-59	2000	72
			2-65	1315	32	16-61	1120	36	11-60	1830	57	13-59	1800	64	6-60	1800	71
						15-62	1700	32	12-61	1050	52	2-60	1830	59	20-61	1445	86
						7-63	0820	33	11-61	0830	42	10-61	1600	74	6-62	1430	60
						4-64	1300	32	3-63	1155	42	9-63	1200	62	18-65	1150	71
						2-65	1620	32	9-64	1430	38	7-64	0730	51			
									5-65	1340	42	5-65	1605	55			
July			August			September			October			November			December		
19-49	1730	78	1-49	1600	84	27-50	0930	52	1-49	1330	60	27-50	1530	32	5-49	1630	32
19-50	1500	79	14-50	1900	64	8-52	1200	76	23-52	1630	50	7-60	1730	36	12-62	1535	32
19-57	1030	67	30-51	1700	77	11-57	1700	64	25-57	1500	42	16-62	1355	36	4-63	1630	32
9-58	1530	74	7-52	1200	82	16-58	1230	62	7-58	1230	59	6-63	1430	42	2-64	0950	32
6-59	1900	76	10-53	1730	71	10-59	0900	52	12-59	1430	44				6-65	1215	34
11-60	1730	81	12-58	1600	82	5-63	1230	67	11-60	1430	54						
17-62	1330	72	6-59	1600	82	16-64	1315	65	10-61	1530	56						
10-63	1800	84	2-60	1700	80	7-65	1730	65	17-62	1200	48						
12-65	1845	75	7-63	1230	78				3-63	1130	62						
			11-64	0800	60				21-64	1130	68						
			19-64	1430	75				7-65	1215	54						
			9-65	1820	78												

198. Powder River near Locate, Mont. (6-3265)

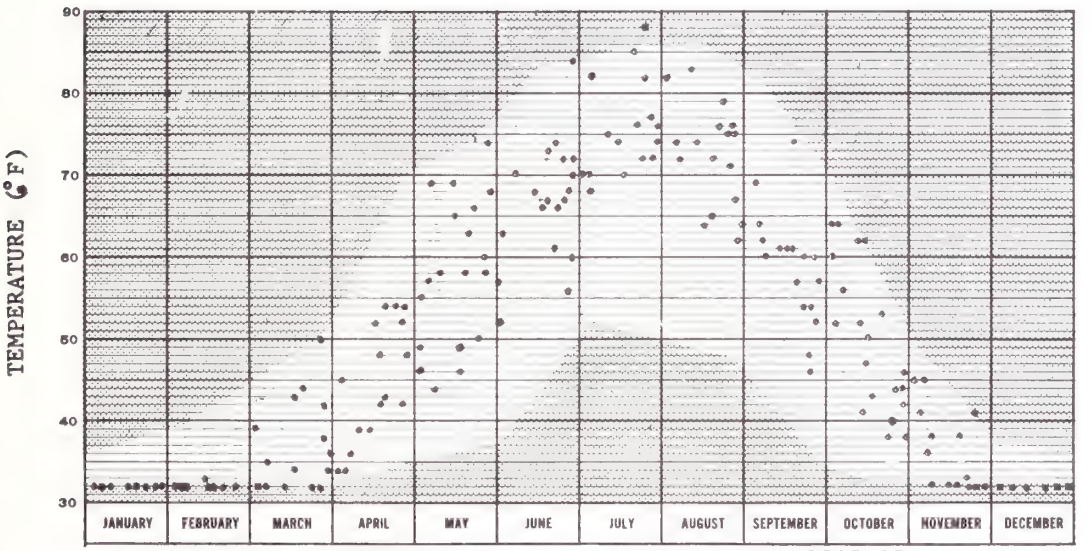
Location.--At gaging station, lat 46°26', long 105°18', in NE¼ sec.26, T.8 N., R.51 E., on right bank 50 ft downstream from bridge on U. S. Highway 12 at present site of Locate (5 miles west of former site of Locate), 3 miles upstream from Locate Creek, and 25 miles east of Miles City. Altitude of gage is 2,400 ft (by barometer).

Drainage area.--13,189 sq mi.

Water temperature records available.--185 spot observations made at time of discharge measurements during period April 1949 to December 1965, including 9 observations made at time of water quality sampling. Once- or twice-daily observations during period March 1951 to July 1963 (incomplete) published in reports of the Geological Survey.

Extremes.--Discharge 1938-65: Maximum observed, 31,000 cfs Feb. 19, 1943; no flow at times in 1950, 1960, 1961.

Water temperatures 1949-65: Maximum observed, 88°F July 27, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1949-65.

198. Powder River near Locate, Mont. (6-3265)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
6-61	1400	32	5-53	1500	32	3-50	1030	39	26-49	1100	52	24-49	1200	50	27-49	1100	60
17-62	0915	32	14-61	0950	32	31-52	1430	36	5-50	1100	34	2-50	0820	46	1-50	1730	57
23-62	1530	32	13-62	1240	32	4-53	1230	32	6-50	0820	34	9-50	1200	44	1-50	1850	51
8-63	1130	32	20-62	1530	32	20-53	1730	44	18-51	1100	42	18-50	0850	49	15-50	0900	67
24-63	1530	32	12-63	1650	33	27-54	1300	38	20-53	1500	54	2-51	0900	49	26-50	0815	56
7-64	0915	32	4-64	1630	32	30-55	1100	34	13-54	1000	39	23-52	1230	66	20-51	0930	67
21-64	1200	32	20-64	1630	32	26-60	1415	50	17-56	1530	52	27-53	1530	74	28-52	1330	72
8-65	1100	32	3-65	0930	32	29-61	1630	42	18-57	1730	48	26-54	1400	60	25-53	1700	67
19-65	1500	32	16-65	1000	32	13-62	1030	32	28-58	1000	48	26-55	1200	58	28-54	1800	70
						22-62	1600	32	27-59	1730	54	17-56	1700	69	23-55	1900	74
						5-63	1600	35	26-60	1700	42	17-57	1700	65	21-56	1700	73
						19-63	1300	43	11-61	0900	39	26-59	1600	58	26-57	1700	68
						3-64	1530	32	4-62	1630	45	27-60	1700	68	25-58	1800	67
						18-64	1600	34	19-62	0930	54	9-61	0920	58	25-59	1700	72
						24-65	1520	32	2-63	1610	34	2-62	1000	55	22-60	1800	61
									7-64	1745	36	7-63	1530	69	9-61	1430	70
									19-65	1500	43	21-63	1530	63	28-61	2000	84
												5-64	1630	57	19-63	1300	66
												20-64	0930	58	2-65	0955	63
												19-65	1030	46	16-65	1000	68
															17-65	1600	72
															23-65	0930	66
July			August			September			October			November			December		
18-49	1700	70	2-50	1250	81	4-50	1800	69	3-49	1500	64	9-49	1130	38	7-61	0950	32
5-50	1730	82	14-50	1800	74	20-50	1530	74	16-50	1200	52	15-50	1300	32	28-61	1000	32
17-50	1600	74	31-51	1130	64	6-51	1200	64	23-51	1000	38	20-52	1530	33	12-62	0915	32
28-53	1030	72	27-52	1430	75	26-51	1030	46	22-52	1430	53	23-54	1600	41	19-62	0915	32
29-54	1700	76	27-53	1000	67	16-52	1600	61	15-53	1430	62	22-57	1300	32	3-63	1500	32
26-55	1930	72	18-54	1700	64	29-52	1030	57	26-53	1500	44	9-61	0940	32	19-63	1700	32
29-57	1600	74	27-54	1730	76	24-53	1330	54	25-54	1400	40	29-61	0900	32	3-64	1715	32
28-59	1730	77	28-57	1000	62	28-54	1200	52	28-55	1000	42	8-62	0900	36	21-64	1500	32
22-60	1230	85	26-58	1600	75	24-56	1630	60	3-56	0900	52	17-62	1415	38	7-65	1300	32
27-61	1445	88	26-59	1900	71	27-57	1630	60	28-58	1630	46	5-63	1500	45			
3-62	0850	68	24-61	1150	79	26-58	1700	54	27-59	1630	44	21-63	1200	32			
2-63	1600	70	7-62	1130	72	26-59	1000	48	16-60	1045	52	4-64	1400	41			
23-63	1115	76	20-62	1730	72	8-61	0955	60	29-60	0930	38	2-65	1500	45			
1-65	1000	70	6-63	0900	74	20-61	1715	57	17-61	1625	47	16-65	1730	32			
14-65	1400	75	20-63	0830	65	17-63	1040	61	2-62	0850	60						
27-65	1600	82	12-65	1300	83	15-64	1330	61	16-62	0830	41						
			23-65	1400	76	7-65	1600	62	2-63	1500	64						
									18-63	1030	50						
									5-65	1505	56						
									19-65	1230	43						

198. Powder River near Locate, Mont. (6-3265)

Summary of once-daily readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1951	Max	--	--	--	56	64	66	78	74	62	65	42	36
	Min	--	--	32	32	46	37	54	56	35	34	32	32
1952	Max	--	34	37	70	70	80	85	80	82	51	49	35
	Min	32	32	32	36	44	57	55	51	45	34	32	32
1953	Max	34	34	50	63	72	81	85	81	80	52	46	36
	Min	32	32	32	33	35	52	52	60	42	38	32	32
1954	Max	34	38	38	54	66	--	--	--	--	62	48	34
	Min	32	32	32	32	35	--	--	--	--	38	32	32
1955	Max	35	35	36	60	72	70	72	72	67	67	41	35
	Min	32	32	32	--	48	53	66	54	40	38	32	32
1956	Max	34	34	45	60	74	75	81	81	77	70	40	35
	Min	32	32	32	36	44	55	58	50	49	33	32	32
1957	Max	34	34	46	58	72	75	82	82	69	70	42	34
	Min	32	32	32	37	48	55	62	60	43	35	32	32
1958	Max	32	32	32	--	69	69	75	77	75	60	42	--
	Min	32	32	32	--	48	58	60	58	45	34	--	32
1959	Max	--	--	--	59	69	83	86	83	68	46	36	32
	Min	32	32	32	--	47	65	64	60	39	33	32	32
1960	Max	32	32	49	55	69	79	86	86	69	55	40	34
	Min	32	32	32	41	47	60	65	64	49	32	32	32
1961	Max	32	32	48	49	67	76	74	78	68	56	40	32
	Min	32	32	32	38	39	66	56	51	37	33	32	32
1962	Max	32	32	36	64	59	75	75	81	70	59	49	37
	Min	32	32	32	36	47	52	62	48	42	38	33	32
1963	Max	36	39	50	58	70	76	84	--	--	-----	--	--
	Min	32	32	32	38	45	64	54	--	--		--	--
Extremes for years 1951-63													
	Max	36	39	50	70	74	83	86	86	82	70	49	37
	Min	32	32	32	32	35	37	52	48	35	32	32	32

199. Burns Creek near Savage, Mont. (6-3292)

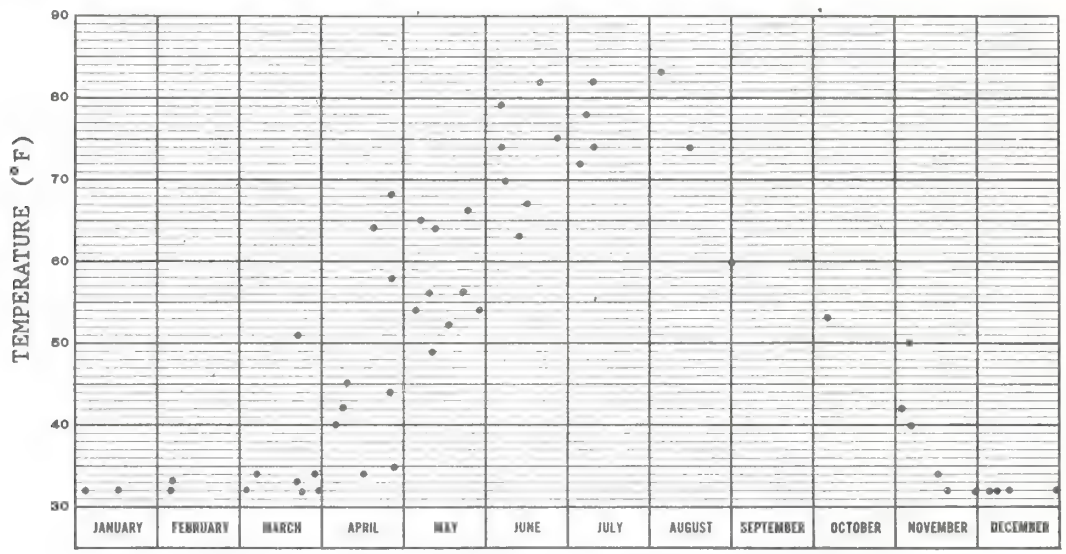
Location.--At gaging station, lat 47°23', long 104°26', near center of west line of sec.26, T.19 N., R.57 E., on right bank 1,000 ft upstream from bridge on State Highway 16, 1 mile upstream from mouth, and 7 miles southwest of Savage. Altitude of gage is 2,000 ft (from topographic map).

Drainage area.--233 sq mi.

Water temperature records available.--56 spot observations made at time of discharge measurements during period November 1957 to December 1965.

Extremes.--Discharge 1957-65: Maximum, 2,100 cfs Mar. 20, 1960; no flow at times in each year.

Water temperatures 1957-65: Maximum observed, 83°F Aug. 4, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1957-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-61	1230	32	5-63	1310	33	2-61	1330	32	25-60	1845	35	25-60	1700	66	14-60	0800	67
3-63	1300	32	4-64	1530	32	8-61	1300	34	11-61	1215	45	9-61	1220	56	27-60	1840	75
14-64	1140	32				20-61	1535	51	25-61	1235	44	15-62	1110	52	5-61	1600	79
						21-62	1310	33	5-62	0945	40	22-62	1130	56	7-62	1700	70
						23-62	1300	32	17-62	1230	64	29-62	0830	54	12-62	1430	63
						28-62	1600	34	24-62	1430	68	7-63	1220	65	20-62	1500	82
						30-64	1825	32	9-63	1125	42	12-64	1130	64	4-63	1400	74
									7-64	1330	40	4-65	1000	54			
									28-64	1100	58	11-65	1145	49			
									13-65	0800	34						
July			August			September			October			November			December		
5-60	1950	72	14-62	1100	74				5-65	0930	53	19-57	1345	32	30-57	1355	32
10-62	1200	74	4-65	1200	83							16-60	1030	34	6-60	1400	32
9-63	1200	82	31-65	1145	60							6-62	1130	50	4-62	1145	32
7-65	1130	78										2-65	0900	42	9-63	1530	32
												30-65	0900	32	8-64	1245	32

200. Yellowstone River near Sidney, Mont. (6-3295)

Location.--At gaging station, lat 47°37', long 104°11', in NW¼NW¼ sec.5, T.21 N., R.59 E., on right bank at Montana Water Conservation Board pumping plant, 2½ miles upstream from Fox Creek, 4½ miles upstream from bridge on State Highway 23, and 7 miles south of Sidney. Altitude of gage is 1,895 ft (from topographic map).

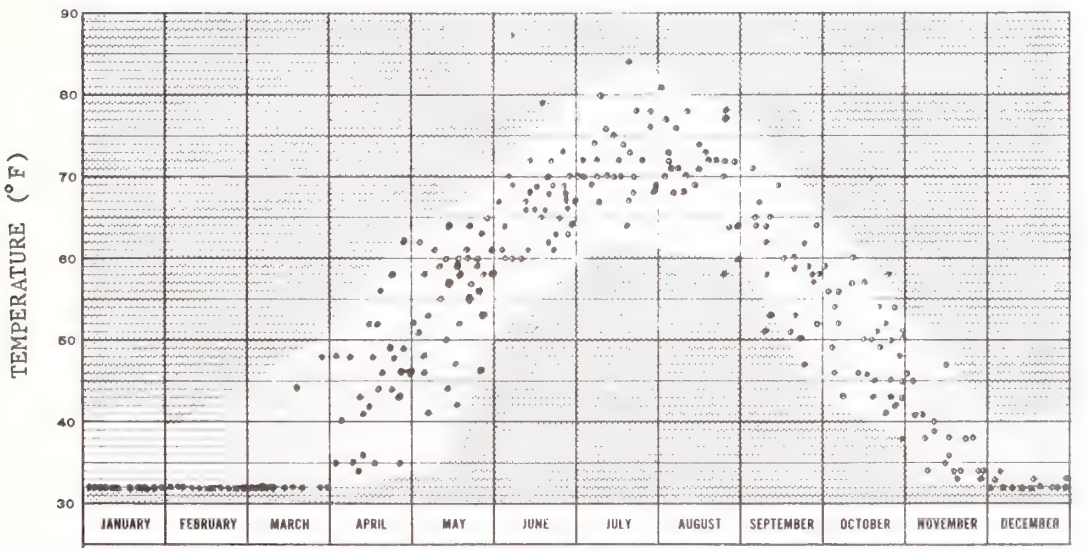
Drainage area.--68,812 sq mi. At highway bridge, 69,103 sq mi.

Water temperature records available.--365 spot observations made at time of discharge measurements during period April 1949 to December 1965. Once-daily observations made at highway bridge 4½ miles downstream during period January 1951 to December 1965 (incomplete) published in reports of the Geological Survey.

Extremes.--Discharge 1910-31, 1933-65: Maximum observed, 159,000 cfs June 21, 1921; minimum, 470 cfs May 17, 1961.

Water temperatures 1949-65: Maximum observed, 84°F July 23, 1960; minimum, freezing point on many days during winter months.

Remarks.--Records collected by Federal Water Pollution Control Administration are not included in this report but are nearly identical to published record. Data are in their files and files of Helena Office of the Geological Survey.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1951-65.

200. Yellowstone River near Sidney, Mont. (6-3295)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
26-54	1630	32	12-54	1645	32	9-54	1230	32	8-49	1150	43	4-49	1200	58	4-49	0930	60
4-61	1045	32	7-61	0830	32	30-60	1430	48	13-49	1200	52	9-49	1130	60	10-49	1000	72
24-61	1005	32	14-61	1045	32	1-61	1150	32	19-49	1200	56	14-49	1000	64	14-49	1200	68
31-61	0850	32	23-61	1135	32	8-61	1110	32	29-49	1130	62	19-49	1230	58	20-49	1330	63
3-62	0935	32	7-62	1415	32	16-61	0950	32	21-53	1500	49	25-49	1130	58	24-49	1130	68
9-62	0910	32	14-62	1520	32	21-61	1545	44	30-53	1030	46	5-50	1230	41	15-50	1300	69
16-62	0900	32	20-62	1320	32	7-62	1100	32	14-54	1150	52	9-50	1300	44	25-50	1630	63
23-62	1205	32	5-63	1140	32	13-62	1215	32	7-60	1030	48	15-50	1230	59	30-50	1500	67
30-62	1015	32	19-63	1100	32	20-62	1730	32	13-60	0830	48	25-50	1230	59	12-51	1600	65
3-63	1140	32	26-63	1115	32	19-63	1115	32	19-60	0755	48	31-50	1400	58	15-51	1400	69
8-63	1000	32	28-63	1530	32	3-64	1010	32	26-60	1110	46	17-51	2000	65	22-51	1100	61
15-63	1600	32	4-64	1010	32	31-64	1420	32	3-61	1850	48	8-52	1400	59	26-51	1700	68
22-63	0900	32	11-64	1200	32	2-65	1045	32	11-61	1025	42	13-52	1400	60	3-52	1315	61
7-64	1020	32	18-64	1115	32	16-65	1015	32	18-61	0800	44	26-52	1130	58	6-52	1645	69
14-64	1000	32	25-64	1045	32	22-65	1730	32	25-61	1010	43	11-53	1550	42	9-52	1300	67
21-64	0900	32	2-65	1045	32	30-65	0930	32	4-62	1745	40	3-57	1120	62	11-52	1800	66
28-64	1100	32	9-65	1015	32				10-62	1045	41	15-57	1205	60	17-52	1145	65
5-65	1100	32	16-65	1145	32				17-62	0800	46	24-57	1215	56	24-52	1630	67
12-65	1030	32	24-65	1030	32				24-62	1030	58	4-60	0835	48	15-53	1730	72
19-65	1015	32							2-63	1200	35	11-60	0945	60	9-60	1210	66
26-65	1115	32							9-63	0945	36	25-60	1015	63	13-60	1545	66
									23-63	1130	49	2-61	1120	52	28-60	0945	64
									7-64	0820	35	9-61	1025	50	2-61	1445	67
									14-64	0810	44	16-61	1245	58	5-61	1430	70
									21-64	1000	49	23-61	1040	64	13-61	1230	79
									28-64	0725	49	31-61	1510	61	20-61	1020	70
									30-64	1700	50	1-62	1140	52	27-61	0835	73
									8-65	1240	34	8-62	0740	55	5-62	0800	60
									12-65	1715	35	14-62	1805	57	7-62	1315	60
									20-65	1030	35	22-62	0945	57	12-62	0900	69
												28-62	1605	53	20-62	1400	66
												7-63	1010	61	25-62	1535	69
												21-63	1015	55	4-63	0800	64
												28-63	1130	61	10-63	1350	61
												1-64	0800	52	19-63	1210	69
												5-64	1600	53	24-63	1320	68
												12-64	1000	52	14-64	1500	62
												19-64	1600	61	23-64	1615	64
												26-64	1200	60	30-64	1050	70
												4-65	0830	46	16-65	1610	63
												11-65	0945	47	29-65	1000	63
												25-65	1100	46			

200. Yellowstone River near Sidney, Mont. (6-3295)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
July			August			September			October			November			December		
6-49	1400	74	3-49	1230	70	7-49	1300	62	5-49	1000	56	14-49	0900	47	11-57	1515	32
11-49	1000	70	8-49	1130	76	13-49	1400	53	14-49	0900	52	29-51	1330	33	23-57	1430	32
16-49	1230	78	13-49	0930	74	24-49	1230	54	29-49	1200	48	4-52	0845	41	2-60	1140	32
21-49	1000	64	19-49	0930	72	3-50	1700	71	4-50	1400	46	13-52	0930	35	6-60	0825	32
27-49	1200	72	24-49	0930	73	13-50	1700	53	10-50	1830	50	15-56	0940	34	13-60	0905	32
5-50	1200	69	4-50	1530	73	18-50	1730	59	13-50	1800	54	26-56	1100	32	19-60	1420	32
10-50	1630	75	19-50	0830	58	22-50	1430	61	18-50	1800	51	14-57	1530	38	28-60	0950	32
15-50	1400	67	24-50	1800	67	28-50	1700	55	10-51	1730	57	27-57	1250	34	12-61	0815	32
20-50	1700	69	30-50	1800	71	4-51	1630	64	18-51	1200	43	16-60	1155	34	19-61	1000	32
25-50	1730	68	8-51	0800	72	11-51	1230	60	6-52	1530	43	22-60	1515	34	27-61	1200	32
30-50	1600	68	28-51	1700	64	20-51	1030	64	13-52	1300	49	7-61	1015	34	4-62	1030	34
16-51	1900	68	5-52	0920	68	8-52	1815	65	20-52	1440	47	14-61	1245	36	3-63	1030	33
1-52	1700	70	11-52	1350	69	22-52	1600	61	28-52	1700	42	21-61	1115	33	10-63	0830	32
9-52	1000	70	25-52	1520	77	7-60	0705	64	25-56	1220	41	6-62	1030	38	20-63	1210	32
16-52	1200	70	1-60	1750	81	13-60	0935	60	9-57	1350	46	14-62	1020	38	31-63	1135	33
28-52	1530	72	9-60	0935	68	20-60	0910	58	18-57	1225	50	20-62	1030	38	1-64	1145	32
27-53	1630	75	16-60	1210	72	27-60	0645	53	24-57	1330	41	27-62	1100	34	8-64	--	32
16-58	1600	70	22-60	1810	74	12-61	1455	51	15-58	0945	50	5-63	0830	41	15-64	1030	32
6-60	0915	70	31-60	0835	64	19-61	0820	57	5-60	0835	52	19-63	0830	38	14-65	0830	33
12-60	1100	74	8-61	0940	72	26-61	1010	50	11-60	0950	50	27-63	0830	33	28-65	1115	32
19-60	0730	78	15-61	0830	72	5-62	0845	67	18-60	0930	45	3-64	0900	45			
26-60	0905	74	22-61	1020	72	19-62	0935	58	3-61	1025	49	9-64	1620	40			
6-61	1130	72	29-61	1140	73	25-62	1015	59	10-61	1010	46	1-65	1630	46			
11-61	0730	72	14-62	0930	73	4-63	0715	65	16-61	1720	54	9-65	1600	39			
18-61	1110	72	20-62	1800	64	10-63	0745	69	24-61	1030	41	15-65	1645	33			
25-61	1730	76	29-62	1800	65	17-63	0800	62	31-61	1140	38	23-65	1030	34			
31-61	1810	73	5-63	1725	71	23-63	1550	66	2-62	1030	56						
2-62	1530	72	13-63	1110	71	7-65	1615	58	8-62	1155	57						
10-62	1045	70	19-63	1640	70	13-65	1600	59	17-62	1030	48						
18-62	0930	72	27-63	0950	78	20-65	1310	51	24-62	0815	45						
31-62	1010	70	3-64	1730	77	27-65	1645	47	30-62	1020	48						
2-63	1400	70	10-64	1700	70				1-63	0830	59						
9-63	1020	76	4-65	1015	72				8-63	1115	60						
15-63	1800	73	10-65	0850	78				15-63	1145	58						
23-63	1100	73	24-65	1715	70				22-63	0815	53						
30-63	1000	72	31-65	1030	60				29-63	0900	42						
8-64	1400	80							27-64	0830	43						
13-64	1830	72							4-65	1745	54						
28-64	1100	70							12-65	1115	51						
7-65	0915	67							18-65	1600	50						
19-65	1540	76							26-65	1045	49						
26-65	1650	74															

200. Yellowstone River near Sidney, Mont. (6-3295)

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1951	Max	32	33	33	38	69	72	80	79	68	60	38	34
	Min	32	32	32	32	34	52	62	64	45	38	32	32
1952	Max	32	32	36	56	--	72	77	77	69	56	47	37
	Min	32	32	32	36	--	62	69	63	--	43	32	32
1953	Max	--	--	--	58	67	78	82	79	72	61	46	38
	Min	--	--	--	--	43	57	72	69	57	38	36	33
1954	Max	34	35	34	54	68	75	79	75	73	56	45	35
	Min	32	32	32	33	43	54	62	68	52	40	34	32
1955	Max	35	32	36	58	66	72	80	78	68	59	43	32
	Min	32	32	32	34	53	58	68	72	52	44	32	32
1956	Max	32	32	38	53	69	72	79	76	67	58	49	37
	Min	32	32	32	37	47	64	69	63	56	41	33	32
1957	Max	32	33	35	61	67	69	79	78	68	63	47	35
	Min	32	32	32	34	54	63	66	64	55	39	33	32
1958	Max	33	32	34	56	69	69	75	77	70	56	44	--
	Min	32	32	32	34	53	58	63	69	52	43	32	32
1959	Max	--	--	41	--	64	72	81	78	66	50	39	32
	Min	32	32	32	--	51	62	63	67	43	33	32	32
1960	Max	32	32	33	54	66	74	84	79	77	57	43	32
	Min	32	32	32	34	52	63	73	64	54	40	32	32
1961	Max	32	32	45	54	69	78	79	79	70	54	40	32
	Min	32	32	32	40	44	66	68	68	46	39	32	32
1962	Max	33	33	35	62	63	73	75	76	71	60	51	36
	Min	32	32	32	34	54	60	62	60	51	46	35	32
1963	Max	32	33	51	55	68	74	80	78	70	65	54	40
	Min	32	32	32	37	51	65	69	69	64	44	39	34
1964	Max	42	39	36	54	63	74	80	78	67	57	50	36
	Min	33	32	32	32	52	60	70	63	52	48	32	33
1965	Max	32	36	36	53	66	68	82	81	67	57	50	40
	Min	32	32	32	34	59	64	68	71	46	51	34	34

Extremes for years 1951-65

	Max	42	39	51	62	69	78	84	81	77	65	54	40
	Min	32	32	32	32	34	52	62	60	43	38	32	32

201. Little Missouri River at Alzada, Mont. (6-3335)

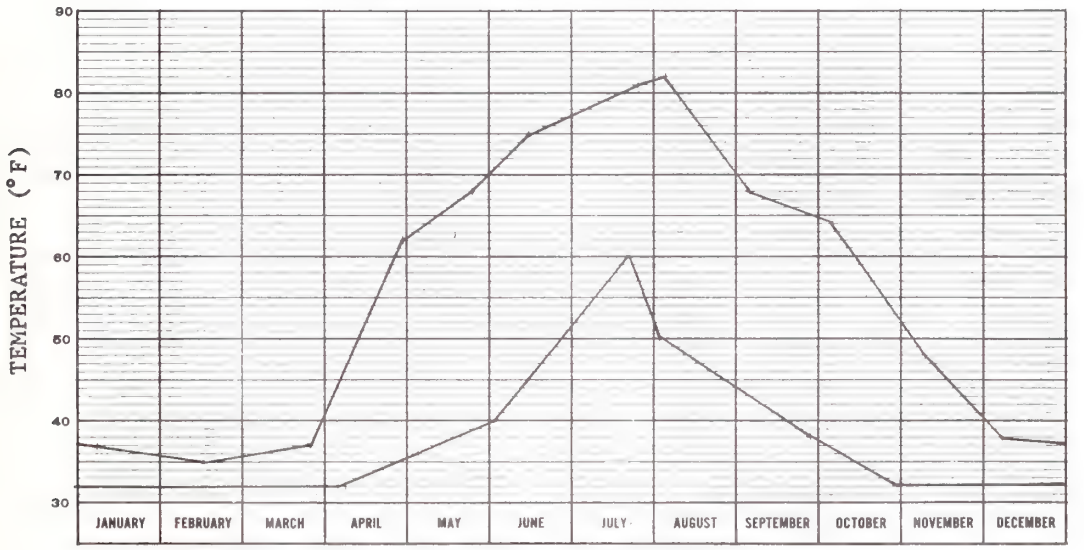
Location.--Lat 45°02'00", long 104°25'30", in NW¼SE¼ sec.24, T.9 S., R.59 E., at bridge on U. S. Highway 212, 1 mile northwest of Alzada. Altitude is 3,400 ft (from river-profile map).

Drainage area.--671 sq mi, at site about 1 mile upstream.

Water temperature records available.--Once-daily observations made during period June 1949 to December 1951 published in reports of the Geological Survey.

Extremes.--Discharge 1904-7: Maximum observed, 3,360 cfs Mar. 27, 1906; no flow at times.

Water temperatures 1949-51: Maximum observed, 82°F Aug. 5, 1949; minimum, freezing point on many days during winter months.



The lines connect the highest and lowest monthly temperatures from once-daily observations, 1949-51

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1949	Max	--	--	--	--	--	68	81	82	63	64	48	38
	Min	--	--	--	--	--	--	63	62	50	37	35	32
1950	Max	--	--	--	50	68	75	76	70	68	53	43	35
	Min	32	--	32	32	36	58	60	50	40	37	32	33
1951	Max	37	35	37	62	68	68	78	74	65	55	40	35
	Min	32	32	32	33	50	40	60	--	38	32	32	32
Extremes for years 1949-51													
	Max	37	35	37	62	68	75	81	82	68	64	48	38
	Min	32	32	32	32	36	40	60	50	38	32	32	32

202. Little Missouri River near Alzada, Mont. (6-3340)

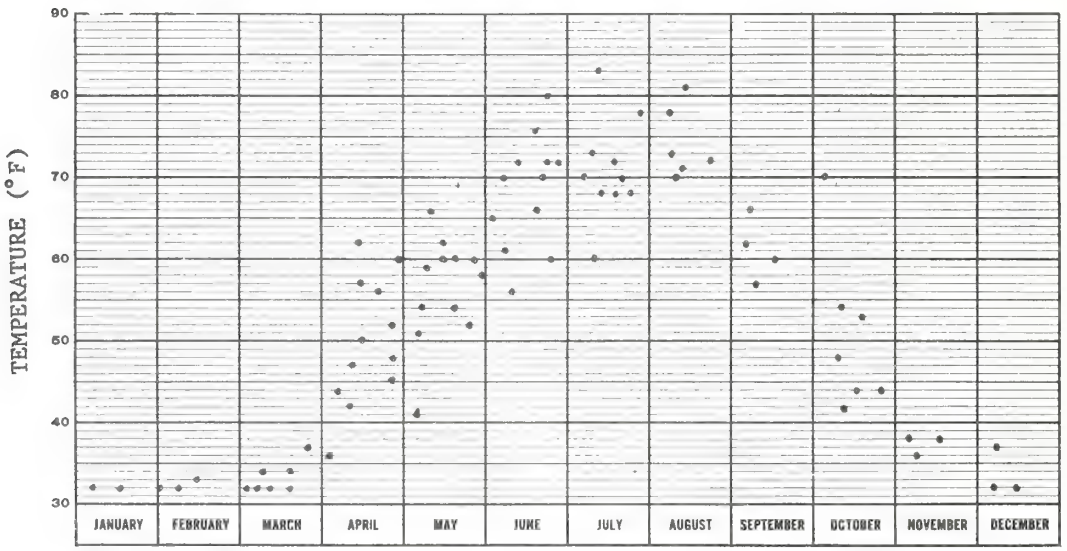
Location.--At gaging station, lat 45°05', long 104°24', in NE¼SW¼ sec.6, T.9 S., R.60 E., on right bank 1.9 miles downstream from Thompson Creek and 4 miles north of Alzada. Datum of gage is 3,367 ft above mean sea level (river-profile survey).

Drainage area.--904 sq mi.

Water temperature records available.--82 spot observations made at time of discharge measurements during period April 1949 to December 1965, including 7 observations made at time of water quality sampling.

Extremes.--Discharge 1911-25, 1928-32, 1935-65: Maximum daily, 6,000 cfs Apr. 4, 1944; no flow at times.

Water temperatures 1949-65: Maximum observed, 83°F July 12, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

202. Little Missouri River near Alzada, Mont. (6-3340)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
9-63	1500	32	13-63	1400	33	8-50	1640	32	28-49	1100	60	26-49	0930	60	22-50	1035	72
4-65	1635	32	5-64	1300	32	26-53	1100	37	6-51	1330	44	5-50	1425	41	18-53	1730	76
			1-65	1630	32	16-61	0905	34	22-53	1000	56	17-50	1120	60	24-55	1500	72
						16-62	0900	32	12-54	1730	50	21-53	1130	52	7-56	1000	70
						6-63	1600	34	10-55	1200	47	30-53	1330	58	23-57	1230	60
						4-64	1500	32	26-56	1400	48	13-54	0830	60	11-59	1300	72
						2-65	1430	32	26-57	1500	52	7-57	0900	54	21-61	1150	80
									26-58	1600	45	13-59	1300	62	7-62	1430	61
									12-60	1230	57	10-61	1100	66	20-62	1100	70
									12-61	1350	62	9-63	1000	59	9-64	1100	56
									3-63	1445	36	7-64	1100	54	2-65	1530	65
									9-64	1700	42	6-65	1050	51	18-65	0915	66
July			August			September			October			November			December		
17-50	1700	72	10-54	1000	71	4-51	1100	62	18-50	1435	53	8-60	1300	36	5-49	1555	32
20-50	1005	68	24-55	0830	72	13-60	1050	60	25-57	1000	44	15-62	1620	38	11-62	1630	32
11-51	1600	60	8-56	0840	70	5-63	1100	66	13-59	1100	42	6-63	1600	38	5-63	1000	32
26-55	1315	78	7-59	1100	73	8-65	0910	57	12-60	1230	54				6-65	1410	37
19-57	1330	70	7-63	1430	78				11-61	1400	48						
7-59	1130	70	11-65	1235	81				17-62	0940	44						
12-60	1130	83							3-63	1400	70						
17-62	1200	68															
10-63	1530	73															
13-65	1015	68															

203. Box Elder Creek near Webster, Mont. (6-3346.3)

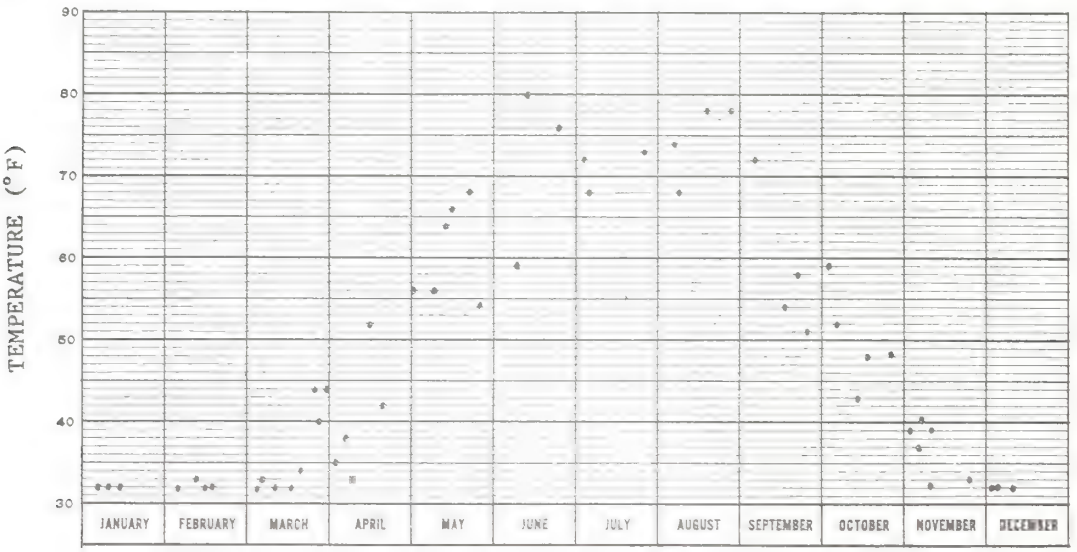
Location.--At gaging station, lat 45°54', long 104°03', in NE¼ sec.30, T.2 N., R.62 E., on left bank at Wayne Cox Ranch, half a mile west of Montana-South Dakota State line, 2 miles upstream from Coal Bank Creek, 17 miles southeast of Webster, and 33 miles southeast of Baker. Altitude of gage is 2,950 ft (from topographic map).

Drainage area.--1,092 sq mi.

Water temperature records available.--58 spot observations made at time of discharge measurements during period September 1959 to December 1965.

Extremes.--Discharge 1959-65: Maximum, about 3,500 cfs Apr. 5, 1965; no flow at times.

Water temperatures 1959-65: Maximum observed, 80°F June 9, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1959-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
6-61	1025	32	14-61	1500	32	25-60	1700	44	15-60	1000	42	17-60	1600	68	9-61	0930	80
9-63	1200	32	12-63	1245	33	26-60	1000	40	11-61	1315	52	9-61	1250	66	8-62	1255	59
7-64	1310	32	4-64	1200	32	30-60	0945	44	5-62	1200	38	1-62	1700	56	23-65	1325	76
7-65	1235	32	15-65	1515	32	9-61	1500	32	2-63	1200	35	7-63	1050	64			
						14-62	1100	32	7-64	1130	33	21-63	1130	54			
						5-63	1200	33				5-64	1100	56			
						18-63	1550	34									
						3-64	1130	32									
						18-64	1200	34									
July			August			September			October			November			December		
3-62	1215	68	18-60	1700	78	26-59	1600	58	24-59	1600	48	8-60	1430	32	7-60	1000	32
2-63	1130	72	7-62	1400	68	28-60	0930	51	15-60	1050	43	28-61	1515	33	12-62	1500	32
28-65	1035	73	6-63	1230	74	20-61	1135	54	17-61	1230	48	8-62	1230	39	3-63	1100	32
			23-65	1535	78	5-63	1215	72	2-62	1220	59	5-63	1130	40	7-65	0900	32
									2-63	1100	59	4-64	1005	37			
									5-65	1035	52	2-65	0850	39			

204. Beaver Creek at Wibaux, Mont. (6-3365)

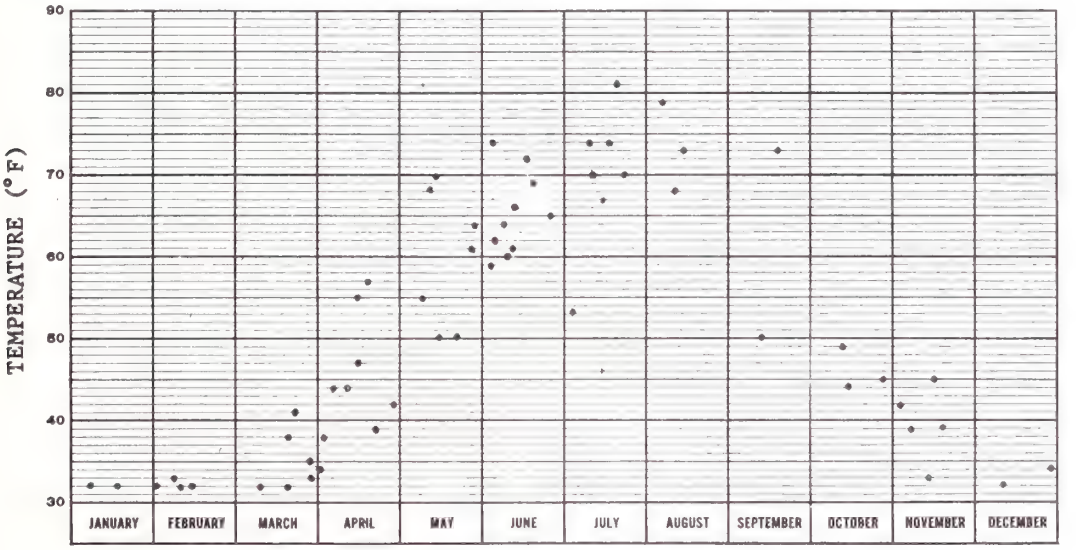
Location.--At gaging station, lat 46°59', long 104°11', in NE¼NE¼ sec.12, T.14 N., R.59 E., on upstream side of bridge on U. S. Highway 10 at Wibaux, 12 miles upstream from Little Beaver Creek, and at mile 62.5. Altitude of gage is 2,650 ft (by barometer).

Drainage area.--351 sq mi.

Water temperature records available.--60 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1938-65: Maximum, 3,780 cfs Mar. 21, 1939; no flow at times.

Water temperatures 1949-65: Maximum observed, 81°F July 16, 1952; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-61	1215	32	1-54	1505	32	9-54	1500	32	5-49	1635	44	5-49	1100	55	4-49	1120	62
14-64	1420	32	9-54	1455	32	23-54	1245	41	20-50	1100	39	10-50	1030	50	15-50	1640	72
			7-63	1300	32	21-61	0750	38	2-52	1630	38	28-52	1500	61	24-52	0830	65
			5-64	1110	33	21-62	1630	32	29-53	1825	42	9-61	1525	70	16-53	0900	69
						28-62	1730	35	14-54	1350	55	15-62	1500	50	3-54	1700	59
						30-64	1635	33	17-62	1500	57	29-62	1100	64	7-62	0730	64
									9-63	1350	44	7-63	1500	68	4-63	1705	74
									14-64	1400	47				8-63	1935	60
									1-65	1500	34				9-63	0930	61
															13-63	1100	66
July			August			September			October			November			December		
10-49	1725	70	11-52	1700	73	14-50	1030	50	12-49	1010	44	15-50	1200	33	30-53	1525	34
13-50	1000	67	9-55	0700	68	16-52	1730	73	11-50	0900	49	18-52	1330	39	9-63	1645	32
16-52	1645	81	4-65	1500	79				29-57	1420	45	17-53	1425	45			
2-54	1250	53										5-54	0925	39			
10-62	1445	74										2-65	1040	42			
20-62	1930	70															
14-65	1430	74															

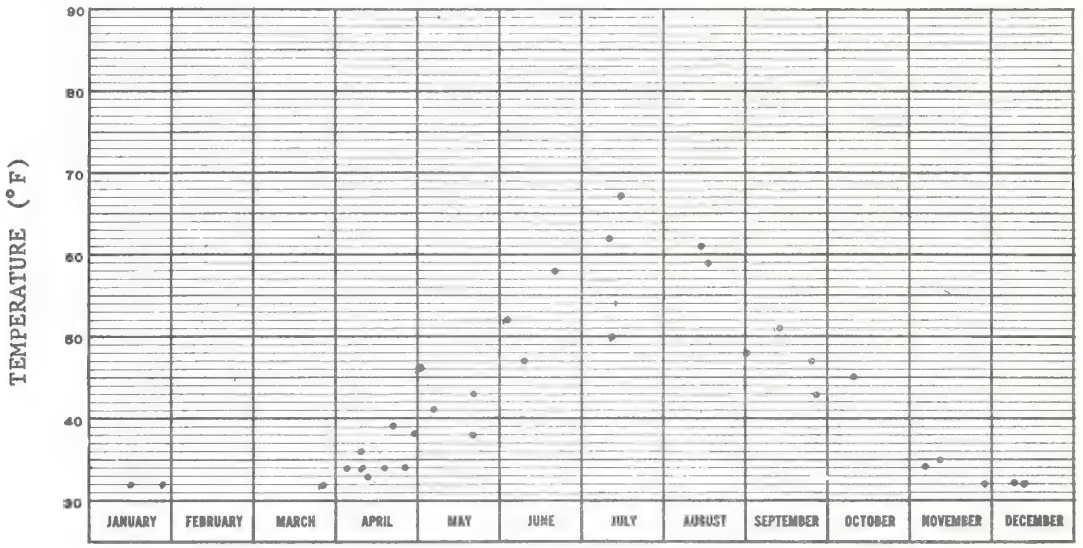
205. Fortine Creek near Trego, Mont. (12-3005)

Location.--At gaging station, lat 48°38'40", long 114°54'40", in NE¼NE¼ sec.11, T.33 N., R.26 W., on downstream side of private bridge, a quarter of a mile upstream from Edna Creek, 1 mile downstream from Stewart Creek, and 5 miles southwest of Trego. Altitude of gage is 3,340 ft (from topographic map).

Drainage area.--112 sq mi.

Water temperature records available.--33 spot observations made at time of discharge measurements during period April 1949 to September 1953, April, May 1960, June 1961.

Extremes.--Discharge 1946-53, 1954, 1958, 1960-65: Maximum, 1,810 cfs May 16, 1950, May 20, 1954.
Discharge 1946-53: Minimum observed, 5.0 cfs Sept. 7, 1949.
Water temperatures 1949-53, 1958, 1960, 1961: Maximum observed, 67°F July 13, 1953; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1960, 1961

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
14-53	1600	32				24-50	1200	32	3-49	1100	34	18-50	1120	38	1-52	1600	52
27-53	1340	32							30-49	1530	46	18-53	1300	43	9-53	1200	47
									20-50	1300	39	5-60	1330	41	23-61	1310	58
									9-51	1430	34						
									15-52	1200	34						
									29-52	1230	38						
									10-53	1100	33						
									24-53	1130	34						
									8-60	1040	36						
July			August			September			October			November			December		
12-50	1800	50	31-51	1200	48	27-51	1300	43	8-52	1500	45	5-49	1600	34	7-49	1530	32
10-52	1000	62	13-52	1330	61	12-52	1230	51				28-51	1100	32	11-52	1600	32
13-53	1300	67	14-53	1000	59	25-53	1030	47				12-52	1445	35			

206. Tobacco River near Eureka, Mont. (12-3013)

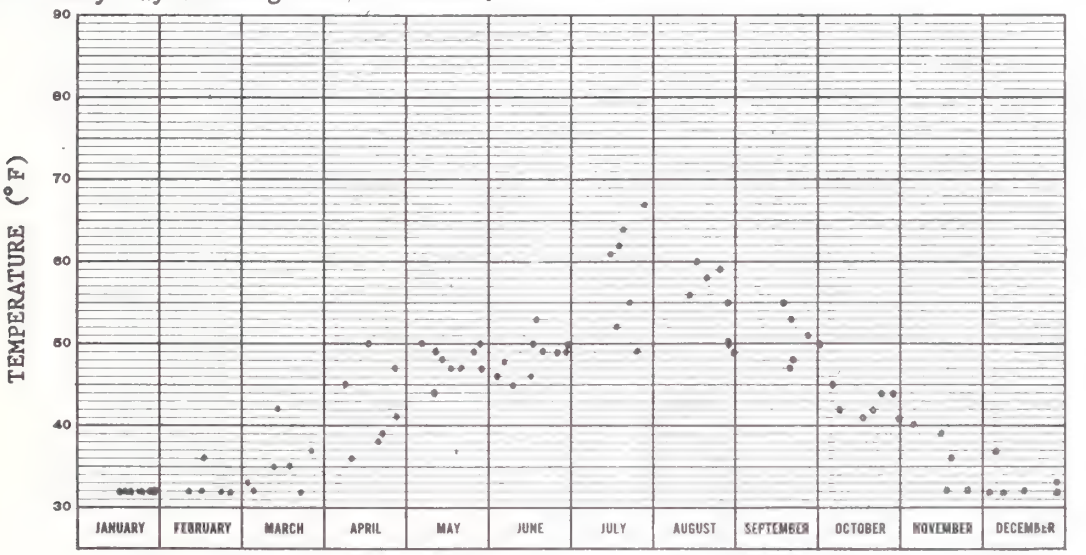
Location.--At gaging station, lat 48°54', long 115°06', in SW¼ sec.9, T.36 N., R.27 W., on right bank 2½ miles northwest of Eureka and 6.0 miles upstream from mouth. Datum of gage is 2,518.85 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Drainage area.--440 sq mi.

Water temperature records available.--86 spot observations made at time of discharge measurements during period September 1958 to December 1965.

Extremes.--Discharge 1948, 1958-65: Maximum known, 2,810 cfs about May 22, 1948; minimum daily, 20 cfs Jan. 11, 1963.

Water temperatures 1958-65: Maximum observed, 67°F July 29, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1958-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
22-60	1200	32	19-60	1100	32	4-59	1130	32	9-59	1030	36	25-59	1130	47	5-59	1330	48
25-61	1030	32	20-61	1200	36	21-60	1230	35	8-60	1600	45	9-60	1630	50	18-59	1300	49
29-62	1200	32	27-62	1200	32	17-61	1400	42	21-61	1030	38	15-61	1300	48	3-60	1500	46
23-63	1300	32	15-63	1400	32	28-62	1100	37	18-62	1630	50	25-61	1230	50	14-60	1130	46
21-64	1300	32	25-64	1100	32	15-63	1130	35	22-63	1200	39	24-62	1200	49	16-61	1300	53
28-65	1430	32				24-64	0830	32	28-64	1130	41	21-63	1100	47	15-62	1100	50
						2-65	1515	33	28-65	1530	47	13-64	1130	44	24-63	1130	49
						24-65	1325	32				18-64	1330	47	8-64	1800	45
												14-65	1540	49	8-64	1930	45
															21-64	1130	49
															25-65	1730	50
July			August			September			October			November			December		
21-59	1500	64	24-59	1500	58	29-58	1130	51	10-58	1600	42	5-58	1630	40	5-58	1300	32
25-60	1030	55	29-60	1100	50	23-59	1430	53	21-59	1300	42	28-60	1130	32	2-59	1130	32
17-61	1200	61	17-61	1000	56	23-60	1030	48	25-60	1300	44	20-61	1100	32	29-60	1200	32
18-62	1030	52	21-62	1100	60	22-61	1030	47	19-61	1100	41	18-63	1100	39	29-61	1300	33
26-63	1000	49	30-63	1330	55	21-62	1400	55	31-62	1130	41	21-64	1635	36	4-62	1400	37
20-64	1430	62	31-64	1200	49	23-64	1600	53	8-63	1100	45				19-63	1130	32
29-65	1520	67	27-65	1220	59				29-64	1440	44				29-64	1200	32
									1-65	1525	50						

207. Kootenai River at Warland Bridge, near Libby, Mont. (12-3018.5)

Location.--At gaging station, lat 48°30'00", long 115°17'10", in NE¼NE¼ sec.34, T.32 N., R.29 W., on right bank at county road bridge, 0.1 mile downstream from Barron Creek, 14½ miles northeast of Libby, and at mile 228.6. Datum of gage is 2,145.4 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Corps of Engineers).

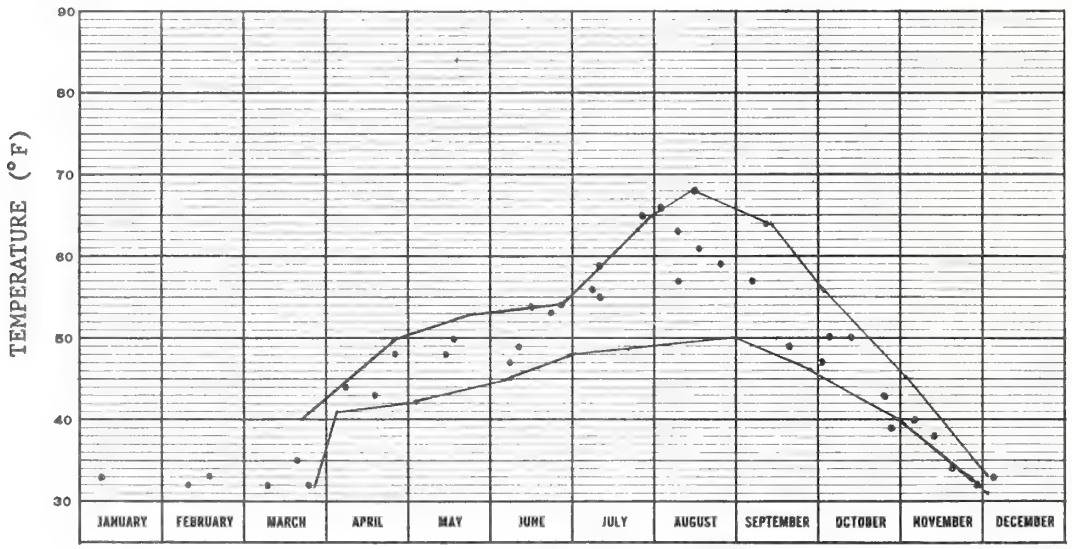
Drainage area.--8,892 sq mi.

Water temperature records available.--37 spot observations made at time of discharge measurements during period August 1961 to December 1965. Thermograph record on a seasonal basis during period June 1962 to November 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1961-65: Maximum, 70,900 cfs June 9, 1964; minimum daily, 1,100 cfs Jan. 12, 1963.

Water temperatures 1961-65: Maximum, 68°F Aug. 14, 15, 1963; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph records furnished by Corps of Engineers.



Spot observations of water temperatures, 1961-65.
The lines connect the highest and lowest monthly temperatures from seasonal thermograph record, 1962-65.

207. Kootenai River at Warland Bridge, near Libby, Mont. (12-3018.5)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
7-63	1400	33	12-63	1430	32	11-63	1400	32	10-63	1430	44	17-62	1830	50	15-62	1830	54
			18-64	1230	33	19-64	1400	35	21-64	1100	43	15-63	1400	48	28-62	1530	54
						24-65	1725	32	28-65	1035	48				10-63	1500	49
															7-64	1050	47
															25-64	1545	53
July			August			September			October			November			December		
10-62	1630	59	2-61	1710	66	5-62	1700	57	3-62	1330	50	7-62	1500	40	4-62	1400	33
10-63	1400	55	7-62	0900	57	10-63	1530	64	10-63	1130	50	12-63	1400	38			
8-64	1300	56	7-63	1000	63	22-64	1100	49	29-64	1200	39	21-64	1400	34			
29-64	1255	65	13-64	1030	61				1-65	1310	47	30-65	1505	32			
			27-65	1000	59				28-65	1310	43						

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Max	--	--	--	--	--	54	64	63	58	49	41	--
	Min	--	--	--	--	--	--	50	55	49	40	--	--
1963	Max	--	--	--	50	--	54	61	68	64	56	40	33
	Min	--	--	--	41	42	--	48	59	55	40	33	32
1964	Max	--	--	40	47	50	51	60	59	54	50	45	--
	Min	--	--	32	--	43	45	49	50	48	42	--	--
1965	Max	--	--	--	49	53	53	65	66	56	50	43	--
	Min	--	--	--	--	44	46	--	55	46	42	--	--
Extremes for years, 1962-65													
	Max	--	--	40	50	53	54	65	68	64	56	45	33
	Min	--	--	32	41	42	45	48	50	46	40	33	32

208. Fisher River near Jennings, Mont. (12-3020)

Location.--At gaging station, lat 48°14'50", long 115°17'30", in NW¼NE¼SW¼ sec.27, T.29 N., R.29 W., on left bank 0.4 mile downstream from bridge, 2.4 miles downstream from Wolf Creek, 8.5 miles southeast of Jennings, and 10 miles upstream from mouth. Datum of gage is 2,433.94 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

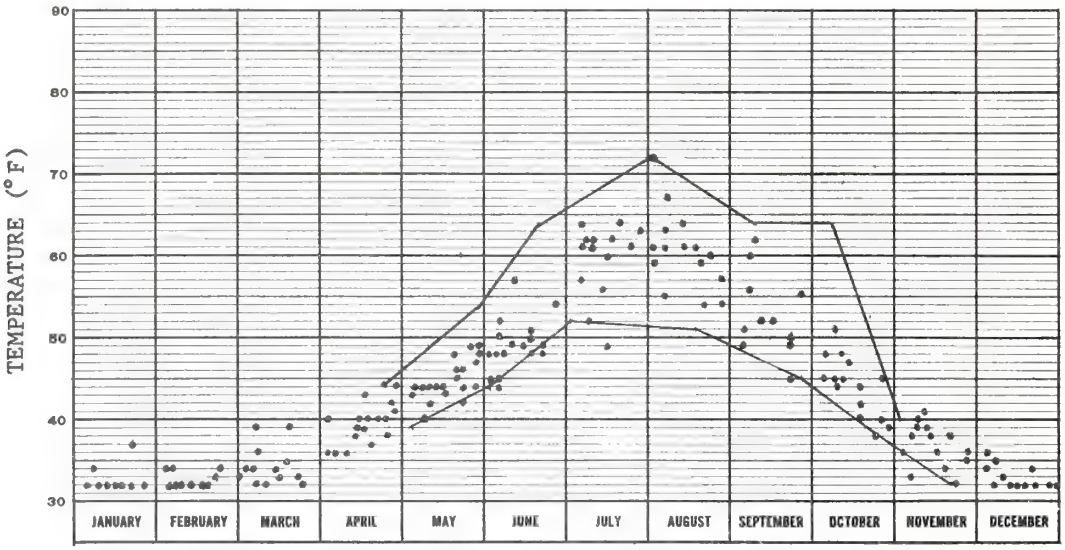
Drainage area.--780 sq mi.

Water temperature records available.--177 spot observations made at time of discharge measurements during period April 1951 to December 1965. Thermograph record on a seasonal basis during period May 1963 to October 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1950-65: Maximum, 6,320 cfs Apr. 17, 1956; minimum daily, 50 cfs Dec. 11, 1961.

Water temperatures 1951-65: Maximum, 72°F Aug. 1, 1965; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph records furnished by Corps of Engineers.



Spot observations of water temperatures, 1951-65.
The lines connect the highest and lowest monthly temperatures from seasonal thermograph record, 1963-65.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
19-53	1600	37	19-53	1600	34	18-53	1200	35	25-51	1100	41	5-52	1330	43	2-53	1800	48
14-54	1330	32	5-54	1100	32	8-54	1530	39	11-52	0900	40	27-52	0830	49	11-53	1700	57
18-55	1300	32	14-56	0930	32	22-55	1300	33	15-53	0930	37	19-53	1000	46	3-54	1100	45
10-56	1000	32	11-57	1700	32	9-56	1000	32	7-54	1030	36	6-54	1600	44	14-54	1100	48
16-57	0930	32	6-58	1430	34	12-57	1500	34	21-55	1230	38	11-54	1100	44	6-55	1300	48
7-58	1400	32	4-59	1500	34	6-58	1400	34	11-56	0930	39	14-54	1100	43	13-56	1030	49
10-61	1030	32	8-61	1230	32	5-59	1330	34	19-56	1400	40	25-54	1130	47	17-57	0930	48
27-61	1530	32	7-62	1700	32	8-61	1730	36	20-56	1400	40	9-55	1200	40	5-58	1100	52
15-62	1500	32	13-63	1030	32	7-62	1230	32	24-56	1030	42	19-55	1230	42	4-59	1000	48
9-63	0930	34	18-64	1630	33	13-63	0930	33	3-57	0930	36	9-56	1530	44	17-59	1000	49

208. Fisher River near Jennings, Mont (12-3020)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
15-64	1400	32				20-64	1500	39	10-58	1130	38	31-56	0830	46	4-60	0800	45
27-65	1210	32				1-65	1340	33	14-59	1400	40	27-57	1230	48	14-60	1800	51
						23-65	1400	32	11-60	1300	40	8-58	1055	44	5-61	1400	50
									5-61	1130	36	12-59	1330	44	14-62	1000	50
									4-62	1730	40	25-59	1200	44	10-63	0930	49
									12-63	1100	39	10-60	0830	42	4-64	0900	44
									21-64	1830	44	22-61	1800	49	24-65	1145	54
									30-64	1500	44	18-62	1400	46			
									13-65	1705	43	17-63	1300	48			
									26-65	1320	44	19-64	1030	44			
												18-65	1515	45			
July			August			September			October			November			December		
9-52	1230	61	12-52	1200	61	21-51	1200	49	18-51	1230	40	29-51	1400	36	10-52	1030	32
7-53	1400	61	6-53	1045	61	9-53	1030	56	6-52	1400	48	10-53	1400	39	16-53	1030	34
14-54	1300	60	11-54	1500	64	24-54	1300	55	29-52	1630	39	22-54	1200	38	29-54	1300	32
18-55	1230	64	18-55	1130	59	13-55	1200	52	9-53	1400	51	8-56	1330	39	8-55	1000	33
16-56	1200	62	20-56	1230	60	25-57	1330	54	25-54	1130	38	6-57	1000	33	11-56	1030	32
24-57	1100	61	26-57	1000	54	10-58	1145	62	18-55	0830	44	7-58	1130	38	3-57	1200	34
8-58	1130	62	6-58	1200	63	16-59	1300	52	8-56	1130	45	24-59	1530	32	3-58	1430	36
15-59	1030	49	19-59	1300	54	7-60	0845	49	9-58	1200	44	15-60	1300	36	11-59	1100	32
6-60	0745	57	2-60	1000	59	21-61	1100	50	12-59	1630	47	3-61	1300	36	5-60	1200	32
7-61	1400	64	2-61	1100	61	7-62	1400	51	18-60	0900	42	8-62	1400	40	13-61	1700	32
9-62	1030	52	6-62	1100	55	9-63	1230	60	11-61	1600	45	13-63	1600	38	6-62	1000	35
12-63	0930	56	8-63	1300	67	21-64	1320	45	5-62	1030	45	10-64	1530	41	13-63	1500	32
9-64	1400	62	14-64	1330	61				11-63	1300	48	20-64	0940	34	31-64	1240	32
28-65	1130	63	26-65	1015	57				28-64	0950	40	29-65	1200	35	17-65	1420	32
									28-65	1535	45				29-65	1310	32

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	--	--	--	54	64	70	69	64	54	40	--
	Min	--	--	--	--	--	46	52	52	48	37	32	--
1964	Max	--	--	--	--	50	58	68	65	56	49	--	--
	Min	--	--	--	--	41	45	55	51	45	38	--	--
1965	Max	--	--	--	44	48	58	71	72	--	64	--	--
	Min	--	--	--	--	39	44	56	57	--	--	--	--

Extremes for years 1963-65

Max	--	--	--	--	44	54	64	71	72	64	64	40	--
Min	--	--	--	--	--	39	44	52	51	45	37	32	--

209. Granite Creek near Libby, Mont. (12-3025)

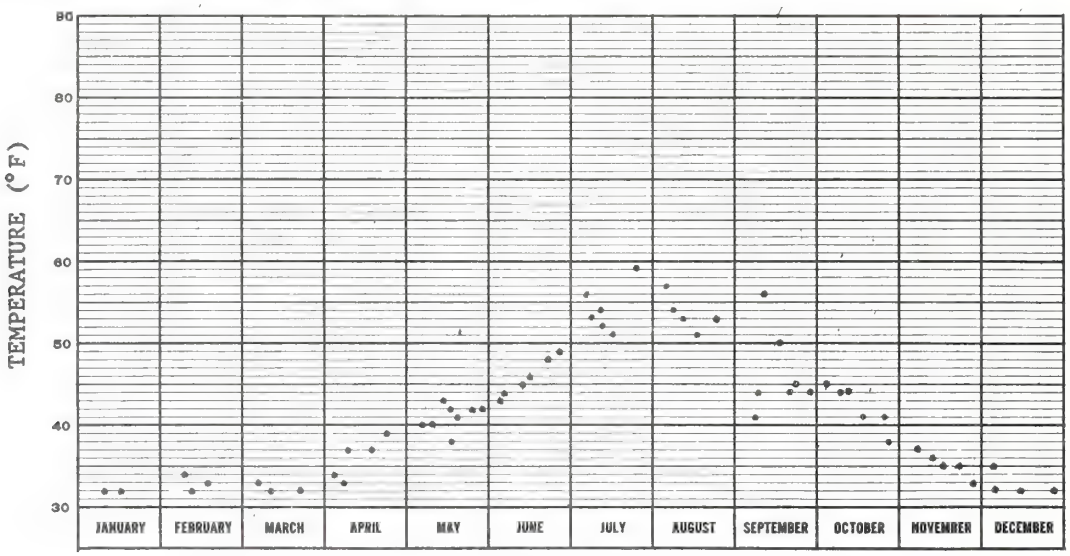
Location.--At gaging station, lat 48°18'10", long 115°35'25", in NW¼SE¼ sec.5, T.29 N., R.31 W., at Glacier Silver Lead mine, 2.5 miles upstream from Cherry Creek, and 7 miles southwest of Libby. Altitude of gage is 2,780 ft (from topographic map).

Drainage area.--23.6 sq mi.

Water temperature records available.--65 spot observations made at time of discharge measurements during period June 1960 to December 1965.

Extremes.--Discharge 1933, 1936-43, 1959-65: Maximum observed, 1,960 cfs Apr. 18, 1938; no flow Jan. 4, 1933 (creek blocked by snow slide).

Water temperatures 1960-65: Maximum observed, 59°F July 28, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1960-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
9-61	1430	32	6-61	1415	32	7-61	1230	33	3-61	1600	34	8-61	1130	40	4-60	1500	43
15-63	1030	32	9-62	1030	34	12-63	0930	32	6-62	1230	33	24-61	1300	42	5-61	1855	44
15-64	1000	32	12-63	1030	32	25-65	1020	32	11-63	0900	37	26-61	1825	42	20-61	1120	48
			19-64	1030	33				20-64	0900	37	17-62	1030	42	14-62	1730	46
			12-65	1220	32				26-65	1640	39	16-63	1530	43	11-63	1000	45
												6-64	1500	40	24-65	1555	49
												19-64	1330	41			
												17-65	1055	38			
July			August			September			October			November			December		
6-60	1705	56	4-61	0900	57	8-60	0900	44	19-60	1615	41	15-60	1530	35	5-60	1500	32
7-61	0900	53	6-62	1530	54	16-60	1010	50	10-61	1100	44	8-62	0930	37	13-61	1430	32
9-62	1500	54	8-63	0900	53	22-61	1215	45	4-62	1530	45	13-63	1200	36	5-62	1000	35
11-63	1230	51	14-64	0900	51	7-62	1030	41	11-63	0900	44	20-64	1125	35	13-63	1000	32
9-64	0900	52	26-65	1445	53	10-63	1900	56	28-64	1520	38	29-65	1410	33	30-64	1150	32
28-65	1615	59				21-64	1520	44	27-65	1350	41				30-65	1400	32
						30-65	1715	44									

210. Kootenai River at Libby, Mont. (12-3030)

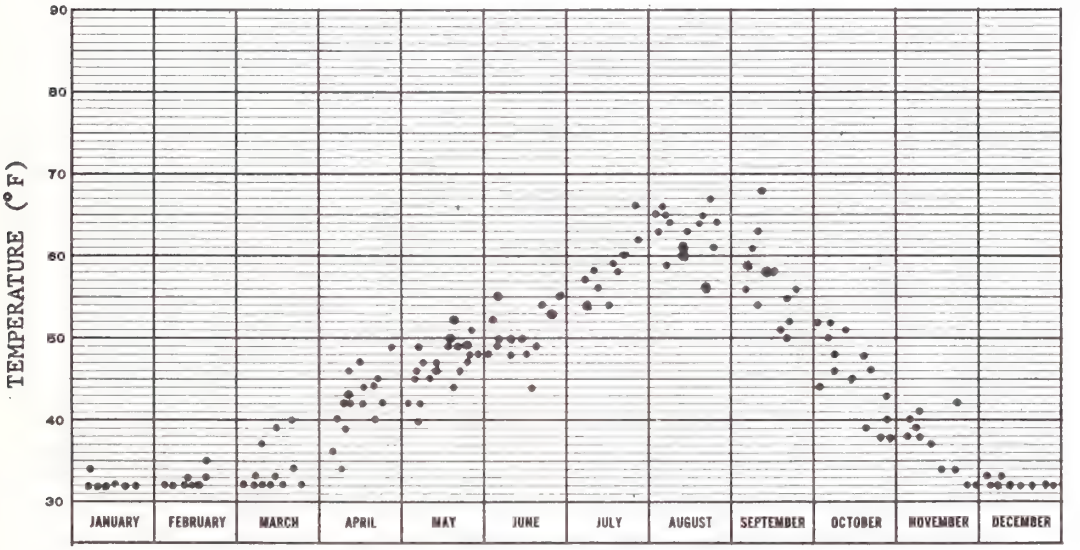
Location.--At gaging station, lat 48°24'00", long 115°33'10", in SE¼SW¼ sec.34, T.31 N., R.31 W., on right bank 1,800 ft downstream from highway bridge at Libby, 0.8 mile downstream from Libby Creek, and at mile 204.3. Datum of gage is 2,041.54 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Drainage area.--10,240 sq mi, approximately.

Water temperature records available.--182 spot observations made at time of discharge measurements during period November 1949 to December 1965.

Extremes.--Discharge 1910-65: Maximum, 121,000 cfs June 21, 1916; minimum observed, 895 cfs Jan. 11, 1930.

Water temperatures 1949-65: Maximum observed, 68°F Sept. 10, 1958; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

210. Kootenai River at Libby, Mont. (12-3030)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
22-50	1600	32	18-53	1730	35	13-50	1430	33	19-50	1830	44	4-50	1200	42	2-53	1900	52
20-53	1530	32	4-54	1700	32	9-54	1100	37	24-51	1730	42	19-50	1130	44	11-53	1125	50
19-55	1000	32	14-56	1300	32	22-55	1630	34	11-52	1430	43	6-52	1130	45	15-53	1730	48
10-56	1300	32	12-57	1400	32	9-56	1300	32	15-53	1300	44	27-52	1330	51	2-54	1800	48
16-57	1430	32	6-58	1730	32	13-57	1600	32	6-54	1730	40	19-53	1430	52	7-55	0745	50
7-58	1630	32	6-59	1000	32	15-60	1700	32	21-55	1630	40	7-54	1100	49	14-56	1400	48
11-60	1700	32	8-61	1000	32	7-61	1730	33	9-56	1500	42	13-54	1500	47	17-57	1200	44
10-61	1630	32	9-62	1600	32	7-62	1600	32	19-56	1700	44	22-54	1530	46	6-58	1330	55
17-62	1530	32	11-63	1630	33	11-63	1700	32	10-57	1530	39	25-54	1630	47	5-59	1000	49
7-63	1630	34	4-64	0900	32	13-64	1400	39	15-59	1600	42	19-55	1700	44	18-59	0930	49
14-63	1330	32	7-64	1500	32	20-64	1200	40	11-60	1630	42	9-56	1630	47	4-60	1200	49
14-64	1700	32	18-64	1500	33	1-65	1710	32	4-61	1830	36	28-57	1400	48	14-60	1600	50
			11-65	1710	32	24-65	1000	32	7-62	1600	34	9-58	1200	42	6-61	1430	50
									10-63	1730	46	14-58	1300	48	20-61	1625	54
									21-64	1400	45	12-59	1600	46	14-62	1330	50
									13-65	1400	47	25-59	1630	47	28-62	1130	55
									27-65	1615	49	11-60	1115	45	10-63	1800	50
												8-61	1800	40	11-64	1000	48
												22-61	1600	49	9-65	1545	50
												24-61	1700	49	25-65	1000	53
												18-62	1030	50			
												31-62	1600	48			
												17-63	0930	49			
												7-64	1400	46			
												19-64	1830	49			
July			August			September			October			November			December		
9-52	0930	58	13-52	1000	63	20-51	1500	55	17-51	1700	39	5-49	1230	38	7-49	1200	32
7-53	0730	54	6-53	1500	65	9-52	1500	54	7-52	1100	50	9-53	1630	41	9-52	1430	32
14-54	1700	54	12-54	1200	60	8-53	1700	61	29-52	1030	40	22-54	1630	42	15-53	1430	32
19-55	1000	60	18-55	1600	65	24-54	1600	56	8-53	1600	48	9-56	1530	38	30-54	1230	32
17-56	1700	58	21-56	1000	67	13-55	1400	58	26-54	0930	38	7-58	0930	39	8-55	1230	33
24-57	1400	66	26-57	1800	64	11-56	1000	58	17-55	1500	48	25-59	1000	32	11-56	1400	32
16-59	1000	59	5-58	1130	66	10-58	1500	68	8-56	1700	52	16-60	1500	34	3-57	1410	33
6-60	1035	57	20-59	1600	56	18-59	1000	51	9-58	1430	46	7-62	1730	40	5-58	1000	32
6-61	0930	57	2-60	1330	65	7-60	1200	56	12-59	1430	45	12-63	1630	37	11-59	1500	32
10-62	0900	58	3-61	0900	63	21-61	1530	50	19-60	1310	46	21-64	0915	34	6-60	1600	32
10-63	1730	56	7-62	1700	59	6-62	1630	59	3-62	1700	52	30-65	1245	32	12-61	1630	32
8-64	1600	57	7-63	1800	64	10-63	0800	63	10-63	1630	51				4-62	1700	33
29-65	0830	62	13-64	1330	61	22-64	1435	52	29-64	1015	38				12-63	1330	32
			17-65	1630	64				1-65	1040	44				28-64	1650	32
			26-65	1800	61				28-65	1000	43				29-65	1745	32

211. Flower Creek near Libby, Mont. (12-3031)

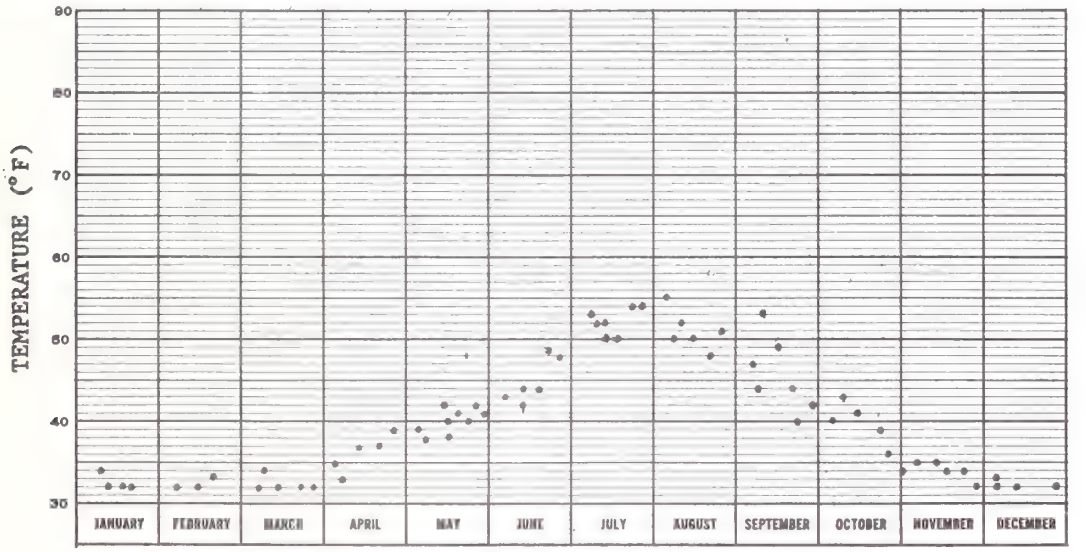
Location.--At gaging station, lat 48°20'40", long 115°35'15", in SE¼ sec.20, T.30 N., R.31 W., on left bank half a mile downstream from South Fork, 3½ miles southwest of Libby, and 4.5 miles upstream from mouth. Altitude of gage is 2,750 ft (from topographic map).

Drainage area.--14.9 sq mi.

Water temperature records available.--71 spot observations made at time of discharge measurements during period July 1960 to December 1965.

Extremes.--Discharge 1960-65: Maximum, 305 cfs May 27, 1961; minimum, 3.8 cfs Jan. 26, 1962.

Water temperatures 1960-65: Maximum observed, 55°F Aug. 4, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1960-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-61	1400	32	6-61	1200	32	7-61	1430	32	3-61	1700	35	8-61	1530	38	5-61	1700	43
16-62	1100	32	12-63	1300	32	8-62	1030	34	6-62	1500	33	22-61	1130	40	20-61	1330	49
8-63	1200	34	17-64	1230	33	12-63	1130	32	11-63	1130	37	26-61	1630	42	14-62	1600	44
15-63	1200	32	12-65	1500	32	20-64	0900	32	20-64	1200	37	17-62	1230	40	11-63	1100	44
15-64	1130	32				25-65	1350	32	27-65	1825	39	16-63	1700	42	11-64	1200	42
												30-63	0900	41	24-65	1355	48
												6-64	1700	39			
												19-64	1500	41			
												17-65	1255	38			
July			August			September			October			November			December		
6-60	1430	53	23-60	1630	48	8-60	1100	44	18-60	1540	41	15-60	1630	34	5-60	1630	32
26-60	1345	54	4-61	1200	55	16-60	1240	49	5-62	0830	40	1-61	1700	34	13-61	1100	32
7-61	1100	52	6-62	1400	50	22-61	0900	40	11-63	1030	43	8-62	1100	35	5-62	1200	33
9-62	1300	50	8-63	1030	52	7-62	0830	47	28-64	1645	36	13-63	1330	35	13-63	1200	32
11-63	1500	50	14-64	1030	50	9-63	1800	53	27-65	1705	39	20-64	1245	34	30-64	1510	32
9-64	1030	52	26-65	1600	51	21-64	1645	44				29-65	1605	32	30-65	1545	32
28-65	1745	54				30-65	1815	42									

212. Lake Creek at Troy, Mont. (12-3035)

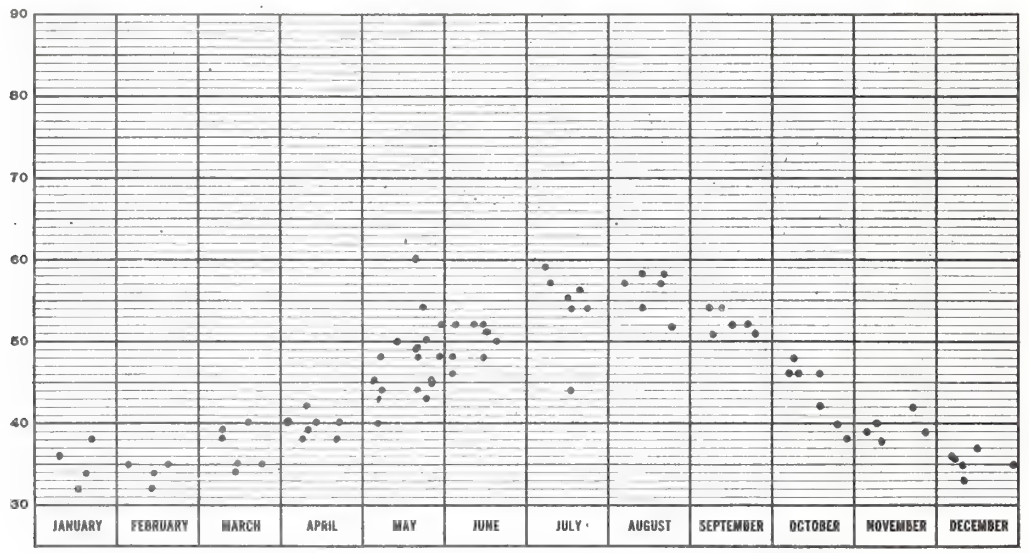
Location.--At gaging station, lat 48°26'40", long 115°52'30", in SW¼ sec.18, T.31 N., R.33 W., on right bank a quarter of a mile downstream from powerplant, half a mile upstream from mouth, and 1¼ miles southeast of Troy. Altitude of gage is 1,900 ft (from topographic map).

Drainage area.--210 sq mi.

Water temperature records available.--81 spot observations made at time of discharge measurements during period March 1949 to September 1957.

Extremes.--Discharge 1945-57: Maximum, 3,250 cfs May 30, 1948; minimum, 2.0 cfs Sept. 1, 1947, Sept. 15, 1948.

Water temperatures 1949-57: Maximum observed, 60°F May 19, 1950; minimum observed, 32°F Jan. 17, Feb. 12, 1957.



Spot observations of water temperatures, 1949-57

212. Lake Creek at Troy, Mont. (12-3035)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
20-53	1100	38	19-53	1000	35	13-49	1330	35	11-52	1100	42	27-49	1800	43	2-53	1500	48
18-55	1630	34	4-54	1300	35	19-53	1500	40	14-53	1130	40	4-50	1630	43	11-53	1400	52
9-56	1600	36	13-56	1430	34	8-54	1230	39	6-54	1300	38	9-50	1345	60	3-54	0900	46
15-57	1530	32	12-57	1200	32	23-55	1100	35	22-55	1130	40	6-52	0930	45	14-54	1530	51
						8-56	1500	38	11-56	1310	39	27-52	1700	54	6-55	1600	52
						13-57	1130	34	20-56	0800	38	19-53	1700	49	14-55	1100	48
									2-57	1200	40	6-54	1200	45	13-56	1530	52
												13-54	1700	50	18-57	0830	50
												21-54	1630	48			
												26-54	0900	45			
												20-55	0930	44			
												9-56	1400	44			
												20-56	1405	50			
												31-56	1500	52			
												7-57	1400	48			
												28-57	1100	48			
July			August			September			October			November			December		
14-49	1600	55	12-52	1500	58	27-49	1800	51	17-51	1430	42	5-49	1100	39	6-49	1500	36
8-52	1400	57	5-53	1145	57	10-52	1600	51	6-52	1600	46	29-51	1630	39	9-52	1600	35
7-53	1800	59	12-54	0900	54	8-53	1230	54	29-52	0930	39	9-53	1200	40	15-53	1630	37
15-54	1000	44	19-55	0800	57	24-54	1800	52	9-53	0900	48	23-54	1000	42	30-54	0930	35
20-55	1030	56	21-56	0730	58	14-55	1330	52	25-54	1500	40	9-56	1130	38	10-56	1630	33
17-56	1130	54	27-57	0930	52	11-56	1700	54	17-55	1600	46						
25-57	0930	54							8-56	1430	46						

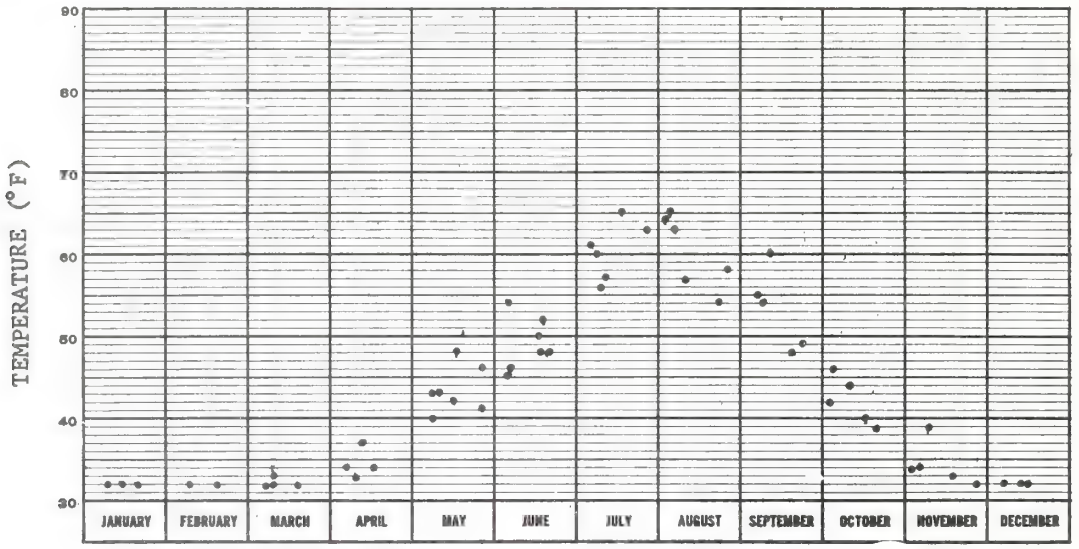
213. Yaak River near Yaak, Mont. (12-3042)

Location.--At gaging station, lat 48°49'40", long 115°48'40", in NE¼ sec.1, T.35 N., R.33 W., on right bank 300 ft upstream from Whitetail Creek, 4½ miles west of Yaak, and at mile 28.4. Altitude of gage is 2,895 ft (river-profile map).

Drainage area.--493 sq mi.

Water temperature records available.--64 spot observations made at time of discharge measurements during period May 1957 to November 1962.

Extremes.--Discharge 1956, 1957-62, 1965: Maximum, 6,650 cfs during flood in May 1965 at site 4½ miles upstream; minimum daily, 35 cfs Jan. 21, 1962.
Water temperatures 1957-62: Maximum observed, 65°F July 15, 1959, Aug. 3, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1957-62

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
8-58	1130	32	7-58	1000	32	6-59	1030	32	15-59	1100	34	7-57	1000	40	17-57	1630	52
12-60	1230	32	16-60	1300	32	16-60	1230	32	12-60	1300	37	27-57	1630	46	5-58	1600	54
11-61	1130	32	7-61	1500	32	8-61	1055	32	4-61	1000	34	8-58	1730	43	4-59	1700	46
16-62	1700	32	8-62	1630	32	8-62	1600	33	7-62	1130	33	13-59	1130	42	17-59	1600	48
												26-59	1100	41	4-60	2000	45
												10-60	1630	43	15-60	1300	48
												9-61	1700	40	15-62	1030	50
												27-61	1020	46			
												16-62	1200	48			
July			August			September			October			November			December		
24-57	1700	63	26-57	1500	58	11-58	1100	60	10-58	1100	42	5-57	1200	34	4-57	1030	32
9-58	1030	56	5-58	1600	63	17-59	1430	48	13-59	1100	40	24-59	1000	32	4-58	1200	32
15-59	1700	65	20-59	1130	54	7-60	1430	54	19-60	0825	39	16-60	0930	33	12-59	1100	32
7-60	2050	60	2-60	1600	64	22-61	1600	49	10-61	1700	44	2-61	1100	34	6-60	1000	32
6-61	1700	61	3-61	1430	65	6-62	0930	55	4-62	1030	46	9-62	1230	39	14-61	1030	32
11-62	1000	57	8-62	1200	57												

214. Yaak River near Troy, Mont. (12-3045)

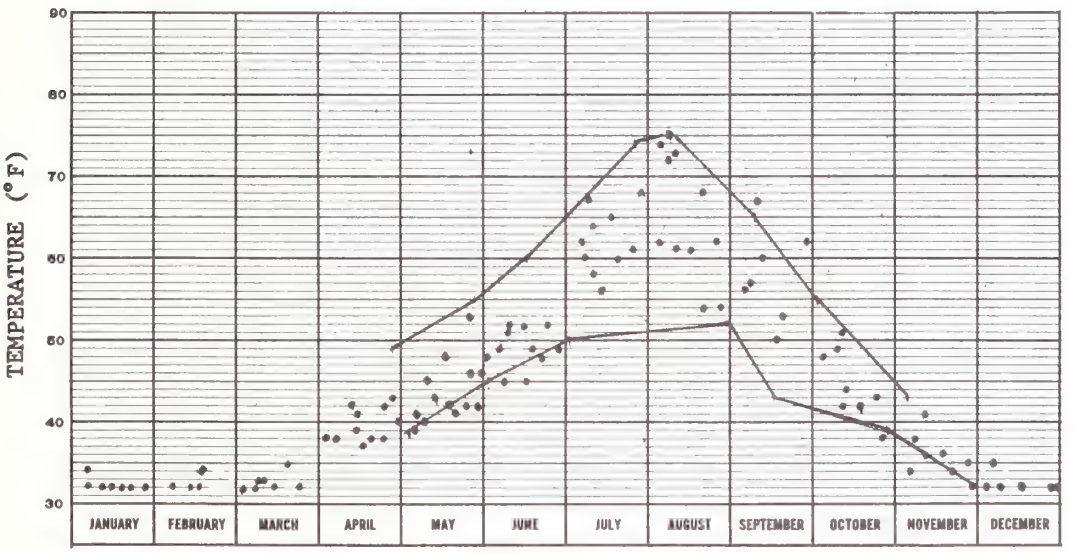
Location.--At gaging station, lat 48°33'45", long 115°58'05", in N½SE¼SE¼ sec.5, T.32 N., R.34 W., on right bank 400 ft upstream from bridge on U. S. Highway 2, a quarter of a mile upstream from mouth, and 7½ miles northwest of Troy. Altitude of gage is 1,850 ft (river-profile map).

Drainage area.--766 sq mi.

Water temperature records available.--108 spot observations made at time of discharge measurements during period April 1956 to December 1965. Thermograph record on a seasonal basis during period May 1963 to November 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1954, 1956-65: Maximum, 13,400 cfs during flood in May 1954; minimum daily, 80 cfs Jan. 19, 1957, Jan. 2, 1958.
Water temperatures 1956-65: Maximum, 75°F Aug. 9, 1965; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph records furnished by Corps of Engineers.



Spot observations of water temperatures, 1956-65.
The lines connect the highest and lowest monthly temperatures from seasonal thermograph record, 1963-65.

214. Yaak River near Troy, Mont. (12-3045)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
15-57	1430	32	12-57	1000	32	13-57	0900	32	10-56	1415	42	7-57	1400	41	1-56	0830	48
8-58	1330	32	7-58	1200	32	7-58	1330	33	20-56	1000	38	28-57	0900	46	13-56	1330	49
12-60	1030	32	16-60	1600	32	6-59	1200	32	24-56	1600	43	9-58	0900	40	17-57	1930	52
11-61	1530	32	7-61	1200	32	8-61	1400	33	2-57	1500	38	23-58	1600	53	6-58	0900	52
8-63	1500	34	11-63	1300	32	19-64	1630	35	11-58	1230	39	13-59	1345	43	4-59	1430	49
14-63	1630	32	17-64	1600	34	2-65	1010	32	15-59	1300	38	26-59	1300	42	17-59	1800	52
14-64	1430	32				23-65	1715	32	12-60	0930	37	10-60	1245	45	5-60	0930	45
27-65	1525	32							4-61	1530	38	9-61	1100	40	15-60	0900	48
									11-63	1500	41	23-61	1830	46	6-61	1910	51
									20-64	1630	42	16-62	1730	48	11-63	1530	52
									27-65	1040	40	10-63	1900	45	11-64	0930	45
												16-63	0900	42	24-65	1920	49
												6-64	0930	39			
												20-64	1030	42			
												17-65	1550	41			
July			August			September			October			November			December		
17-56	1000	60	20-56	1500	68	11-58	0830	60	9-56	1430	49	9-56	1000	36	4-58	1525	32
25-57	0800	61	27-57	0730	54	17-59	1030	50	10-58	1300	42	5-57	1430	34	6-60	1230	32
9-58	2000	58	5-58	1730	72	7-60	1700	57	19-60	1030	42	6-58	1500	38	5-62	1500	35
15-59	1430	65	20-59	0930	54	6-62	1200	56	11-61	1030	44	16-60	1200	34	12-63	1630	32
7-60	1200	60	3-60	0900	62	9-63	1500	67	4-62	1300	48	9-62	1000	41	29-64	1840	32
6-61	1200	62	3-61	1700	74	22-64	1705	53	10-63	1600	51	13-63	1000	36	30-65	1030	32
11-62	1230	64	8-62	1000	61	30-65	1405	62	28-64	1315	38	28-64	1525	35			
11-63	1030	56	7-63	1600	73				27-65	1400	43	30-65	0945	32			
8-64	1830	67	13-64	1630	61												
28-65	1410	68	26-65	1235	62												

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	--	--	--	49	60	65	71	65	55	39	--
	Min	--	--	--	--	--	46	50	57	52	39	32	--
1964	Max	--	--	--	--	48	60	69	68	60	50	--	--
	Min	--	--	--	--	39	45	--	52	48	39	--	--
1965	Max	--	--	--	49	55	60	74	75	61	52	43	--
	Min	--	--	--	--	42	49	53	53	43	42	--	--

Extremes for years 1963-65

Max	--	--	--	49	--	55	60	74	75	65	55	43	--
Min	--	--	--	--	--	39	45	50	52	43	39	32	--

215 . German Gulch Creek near Ramsay, Mont. (12-3235)

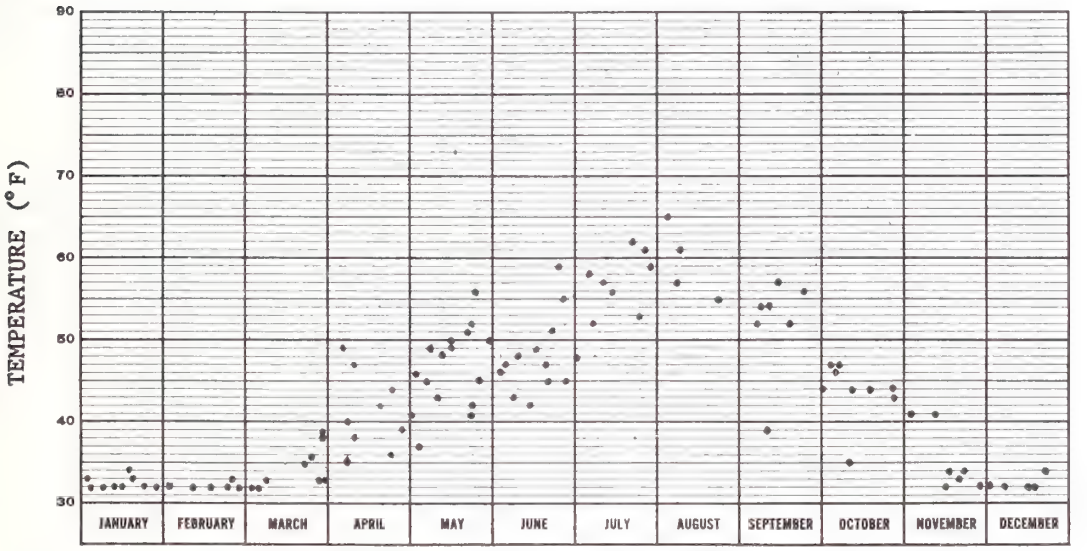
Location.--At gaging station, lat 46°00'50", long 112°47'30", in SE¼NW¼ sec.13, T.3 N., R.10 W., half a mile upstream from mouth and 6½ miles west of Ramsay. Altitude of gage is 5,200 ft (by barometer).

Drainage area.--40.6 sq mi.

Water temperature records available.--103 spot observations made at time of discharge measurements during period April 1955 to December 1965.

Extremes.--Discharge 1955-65: Maximum, about 450 cfs June 17, 1965; minimum, 2.6 cfs Mar. 15, 1959.

Water temperatures 1955-65: Maximum observed, 65°F Aug. 4, 1959; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1955-65

215. German Gulch Creek near Ramsay, Mont. (12-3235)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
12-56	1600	32	24-59	1500	33	22-57	0915	35	26-55	1330	36	25-55	0830	41	9-55	1400	48
3-57	1300	32	13-61	1425	32	5-58	0925	33	9-57	1230	38	1-56	1325	41	14-55	1430	49
29-58	1600	32	8-63	1030	32	24-59	1230	36	9-58	1430	47	2-57	1530	46	4-57	1500	46
15-59	1330	34	27-64	1300	32	2-62	1300	32	6-59	1130	35	8-57	1215	45	2-61	1230	47
16-61	1400	33	2-65	1205	32	30-62	1000	33	4-60	1430	49	19-58	1800	49	24-61	1905	59
23-62	1300	32	23-65	1400	32	3-63	1430	32	7-61	1250	40	26-58	1500	56	8-62	0800	43
8-63	1030	32				30-63	1130	38	30-62	1030	39	13-59	1400	43	26-62	1130	55
2-64	1510	33				30-64	1300	39	27-64	1400	44	10-60	1800	49	28-63	0730	45
11-65	1615	32				29-65	1130	33	21-65	1210	42	31-60	1655	50	13-64	0830	42
												16-61	1420	48	13-64	0900	42
												24-61	1830	52	18-64	1300	47
												28-62	1300	45	18-65	1150	45
												3-63	1000	37	21-65	1145	51
												23-63	1400	51			
												19-64	1510	50			
												25-65	1115	42			
July			August			September			October			November			December		
29-55	1130	59	7-57	1730	61	8-55	0800	54	1-57	0900	44	9-55	1600	41	16-58	1600	34
11-57	1050	56	4-59	1600	65	19-56	1315	56	3-59	1630	47	17-58	1400	33	13-60	1310	32
9-58	1500	57	6-63	1130	57	15-58	1600	52	9-61	1115	35	14-60	1655	34	14-61	1150	32
6-59	1500	52	25-64	1400	55	9-59	0800	39	5-62	1430	47	13-61	1125	32	5-62	1300	32
5-60	1920	58				12-60	1520	57	29-62	1300	43	18-63	1145	34	1-65	1535	32
28-60	1815	61				6-61	1140	52	15-63	1215	44	2-64	1210	41			
24-61	1220	62				9-63	1200	54	10-64	1245	44	30-64	1700	32			
1-65	1445	48							4-65	1230	46						
26-65	1015	53							29-65	1500	44						

216. Racetrack Creek below Granite Creek, near Anaconda, Mont. (12-3241)

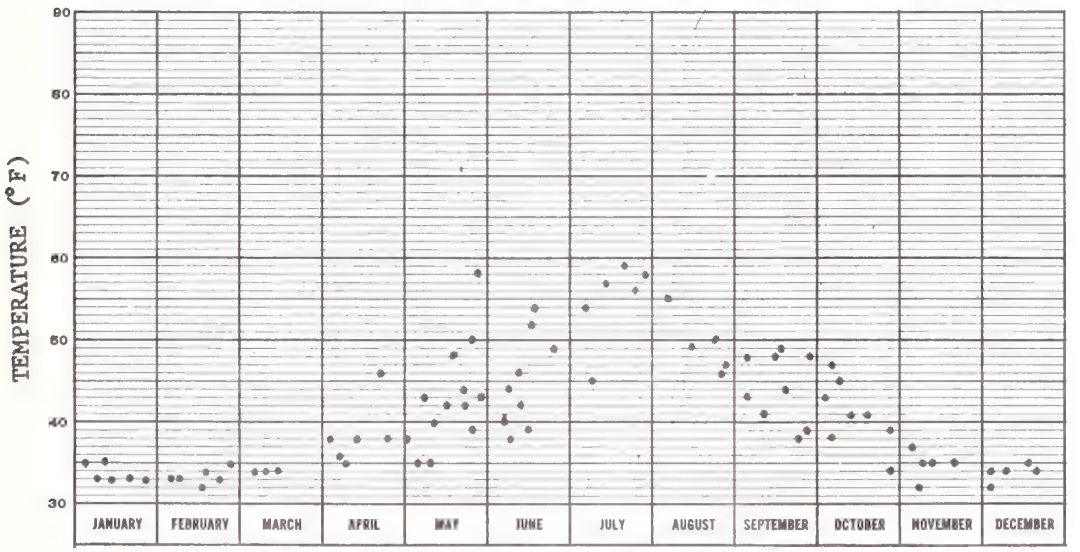
Location.--At gaging station, lat 46°16'40", long 112°55'00", in NW¼NE¼ sec.13, T.6 N., R.11 W., on right bank 30 ft upstream from bridge, 2 miles downstream from Granite Creek, 9½ miles upstream from mouth, and 10 miles north of Anaconda. Altitude of gage is 5,420 ft (from topographic map).

Drainage area.--39.5 sq mi.

Water temperature records available.--82 spot observations made at time of discharge measurements during period September 1957 to December 1965.

Extremes.--Discharge 1956-65: Maximum, 537 cfs June 17, 1965; minimum, 7.2 cfs Dec. 24, 1962, Mar. 23, 1964.

Water temperatures 1957-65: Maximum observed, 59°F July 21, 1960; minimum, freezing point at times during winter months.



Spot observations of water temperatures, 1957-65

216. Racetrack Creek below Granite Creek, near Anaconda, Mont. (12-3241)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-58	1330	33	25-59	1300	35	7-58	1215	34	11-58	1000	38	19-58	1405	48	9-60	1650	44
15-59	1100	35	4-60	1620	33	9-61	1515	34	6-60	0830	36	26-58	1200	58	13-61	1230	46
17-61	1045	33	17-61	1010	32	5-62	1400	34	7-61	1030	35	13-59	1200	42	20-62	1700	54
24-62	1400	33	18-63	1630	34				25-61	1430	38	4-60	0930	35	19-63	1400	52
3-63	1730	35	5-64	1300	33				23-62	1930	46	5-61	1650	43	9-64	1100	38
13-65	1120	33	21-65	1355	33				2-65	1100	38	24-61	1635	50	13-64	1130	42
												30-61	1410	43	29-64	1300	49
												22-62	1900	42	8-65	1050	40
												7-63	1100	40	18-65	0900	39
												22-63	1230	44			
												1-64	1030	38			
												23-64	1200	39			
												6-65	1035	35			
July			August			September			October			November			December		
7-59	0830	45	4-59	1400	55	16-57	0900	44	16-58	1200	41	3-59	1100	37	16-58	1330	35
21-60	1315	59	22-61	0900	50	30-57	2000	48	4-59	0900	38	5-60	1535	32	17-59	1055	34
11-61	1500	57	29-63	1030	47	15-58	1430	49	6-60	1525	45	19-62	1800	35	2-60	1030	32
24-62	1800	56	28-64	1405	46	9-59	1030	41	29-61	1800	34	7-63	1030	35	5-64	1610	34
24-63	1500	56	11-65	0900	49	13-60	1525	48	11-62	1730	41	6-64	1335	35	2-65	1615	34
27-64	1430	58				25-61	1000	38	4-63	1230	47						
6-65	1405	54				4-62	1930	48	2-64	1400	43						
						4-65	1300	43	29-65	1115	39						
						27-65	1300	39									

217. Flint Creek near Southern Cross, Mont. (12-3255)

Location.--At gaging station, lat 46°14'00", long 113°17'40", in SE¼NW¼ sec.36, T.6 N., R.14 W., on left wing of weir half a mile downstream from powerplant, 2 miles downstream from Georgetown Lake, 3 miles northwest of Southern Cross, 6 miles south of Philipsburg, and at mile 36.8. Altitude of gage is 5,630 ft (from topographic map).

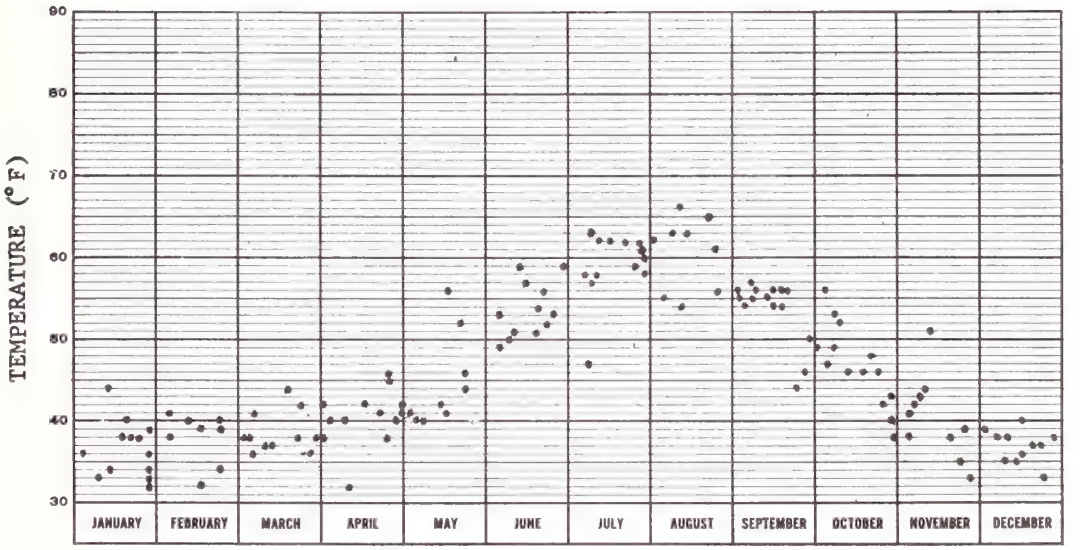
Drainage area.--52.6 sq mi.

Water temperature records available.--147 spot observations made at time of discharge measurements during period May 1949 to December 1965.

Extremes.--Discharge 1940-65: Maximum, 174 cfs June 13, 1942; probably no flow for parts of Aug. 20, 1943, May 23, 1952, Oct. 6, 1954, when generator was shut down.

Water temperatures 1949-65: Maximum observed, 66°F Aug. 10, 1965; minimum, freezing point at times during winter months.

Remarks.--Water temperatures affected by storage in Georgetown Lake.



Spot observations of water temperatures, 1949-65

217. Flint Creek near Southern Cross, Mont. (12-3255)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
17-50	1400	34	6-52	1200	38	20-51	1105	44	26-51	1520	46	17-49	1700	41	15-49	1500	57
24-51	1220	40	17-55	0930	39	4-52	0900	36	1-52	1700	38	23-50	1510	44	22-50	0815	53
29-53	1730	32	14-57	1625	40	2-54	1510	38	22-53	1350	41	15-51	0905	42	13-51	1325	59
22-54	1555	38	17-61	1150	32	30-54	1100	38	27-54	1300	40	2-57	1250	41	19-52	0930	54
29-55	0900	36	23-62	0930	34	10-55	1530	37	1-55	1330	42	19-58	0830	56	8-54	1155	50
10-57	1430	33	23-63	1030	40	26-57	1300	36	15-58	1200	42	4-60	1110	40	9-55	1100	51
29-58	1100	33	23-64	1330	39	5-58	1515	41	29-59	1100	41	5-61	1400	40	15-56	0800	57
26-59	1230	38	5-65	1145	41	9-61	1340	37	6-60	1010	40	25-61	1655	44	4-57	1250	53
17-61	1230	44				23-62	0830	38	7-61	0840	32	23-62	0930	46	9-60	1440	51
25-62	0830	38				25-63	1200	42	24-62	0900	38	22-63	1400	52	21-62	0930	52
4-63	1000	36				3-65	1550	38	26-63	1430	45				20-63	1000	56
29-63	1100	34							3-64	1115	40				29-64	1430	59
29-64	1230	39							30-64	1000	42				4-65	1120	49
									1-65	1125	40				18-65	--	51
									26-65	1535	40						
July			August			September			October			November			December		
18-50	0840	62	11-49	1300	63	16-49	1200	54	28-49	1300	40	29-50	1100	33	9-49	0930	35
24-52	1815	58	1-52	1215	62	18-51	0900	54	24-51	1345	42	27-51	0900	39	28-50	0920	38
7-54	1430	58	10-54	1800	54	19-52	1030	56	21-52	1230	48	25-52	0820	35	28-51	0930	38
28-55	2030	61	8-57	0900	63	8-54	1120	57	6-54	1300	49	10-53	1000	51	22-52	1400	33
13-56	1200	62	4-59	0930	55	8-55	1100	55	7-55	1100	52	8-54	1700	43	9-53	1100	38
11-57	1310	62	22-61	1130	65	18-56	1630	56	17-56	0830	46	9-55	1330	44	15-54	1600	37
10-58	1000	58	28-63	1400	61	3-57	1300	55	22-58	1200	46	5-60	1400	38	12-56	1535	40
10-58	1030	58	28-64	0740	56	30-57	1730	50	4-59	1100	47	20-62	0930	38	16-59	1550	37
7-59	1000	47	10-65	1215	66	16-58	0930	56	6-60	1300	53	7-63	1210	42	2-60	1150	39
21-60	1105	62				9-59	1330	56	29-61	1500	38	6-64	1010	41	12-61	1530	36
11-61	1135	63				13-60	1330	55	12-62	0900	46				11-63	1530	35
25-62	0830	58				24-61	1630	44	4-63	1000	56				5-64	1300	38
24-63	1200	60				5-62	0900	54	1-64	1600	49				3-65	1100	36
25-64	0730	59				2-65	1855	56	28-65	1735	43						
9-65	1000	57				28-65	1140	46									

218. Flint Creek at Maxville, Mont. (12-3295)

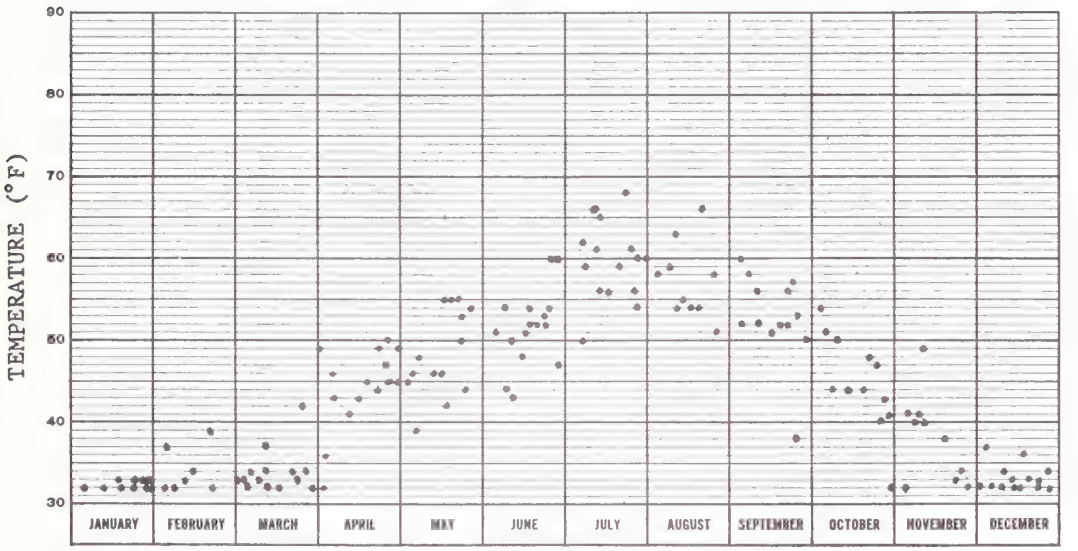
Location.--At gaging station, lat 46°28'00", long 113°14'30", in NW¼ sec.9, T.8 N., R.13 W., on right bank 0.4 mile west of Maxville and 1 mile upstream from Boulder Creek. Datum of gage is 4,828.44 ft above mean sea level, datum of 1929.

Drainage area.--208 sq mi.

Water temperature records available.--155 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1941-65: Maximum, 1,680 cfs Mar. 28, 1943; minimum daily, 15 cfs Feb. 25, 1962.

Water temperatures 1949-65: Maximum observed, 68°F July 20, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

218. Flint Creek at Maxville, Mont. (12-3295)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
18-50	1200	32	14-57	1155	33	13-50	1200	32	12-49	1100	41	18-49	1230	42	16-49	0930	52
24-51	1615	33	4-60	1040	32	20-51	1500	34	18-50	1400	45	24-50	0800	44	22-50	1300	47
29-53	0900	32	17-61	1420	34	4-52	1500	32	27-51	1050	45	15-51	1530	46	15-51	0830	52
23-54	1200	32	23-62	1600	32	11-53	0900	34	2-52	1200	32	7-52	1535	48	19-52	1430	54
29-55	1200	32	7-63	1330	32	2-54	1350	33	22-53	1020	44	16-52	0800	46	8-54	0925	44
12-56	0900	32	23-63	1530	39	29-54	1630	32	27-54	1000	45	23-54	1400	53	15-56	0925	54
12-57	1530	32	5-65	1325	37	11-55	1030	32	15-58	1100	43	2-57	1000	45	4-57	0730	51
28-58	1700	32				26-57	1000	34	29-59	1300	45	20-58	1530	55	9-60	1130	50
26-59	1400	33				5-58	1100	34	6-60	1305	46	4-60	1410	46	14-61	0800	51
17-61	1515	33				11-59	1100	37	6-61	1515	43	5-61	1130	39	21-62	1700	60
25-62	1500	33				9-61	1110	33	24-62	1400	49	25-61	1350	54	20-63	1530	60
4-63	1430	32				22-62	1700	33	26-63	1800	50	23-62	1530	50	9-64	1700	43
29-63	1700	33				25-63	1530	42	3-64	1230	36	22-63	1800	55	12-64	1700	48
29-64	0900	32				1-65	1410	33	30-64	1130	49	19-64	1700	55	18-64	1430	53
									1-65	1300	49				8-65	1545	54
									26-65	1210	47				18-65	1700	52
July			August			September			October			November			December		
18-50	1330	59	12-49	0930	55	15-49	1400	52	27-49	1500	43	29-50	1430	32	8-49	1400	32
23-52	1700	61	16-50	1700	54	19-50	1200	53	24-51	1020	40	27-51	1500	34	28-50	1610	34
7-54	1200	62	15-51	0900	54	17-51	1400	56	21-52	0800	48	25-52	1600	33	28-51	1530	32
28-55	1830	60	10-54	1430	54	18-52	1700	57	6-54	1030	44	10-53	1200	49	23-52	0900	32
12-56	1830	66	8-57	1300	59	8-54	1000	52	7-55	1430	50	8-54	1330	41	9-53	1230	34
11-57	1600	65	3-59	1500	58	8-55	1400	56	16-56	1045	44	9-55	0900	40	12-56	1000	32
10-58	1500	61	22-61	1600	66	3-57	0900	60	22-58	1300	47	5-60	1140	32	23-58	1330	33
7-59	1400	50	28-63	1530	58	30-57	1030	50	5-60	1610	51	20-62	1430	38	16-59	1230	36
20-60	1515	68	28-64	0830	51	16-58	1400	52	29-61	1030	32	7-63	1500	40	1-60	1605	32
11-61	0730	56	10-65	1425	63	13-60	1105	51	12-62	1430	44	5-64	1600	41	13-61	1100	32
25-62	1500	60				24-61	1100	38	3-63	1700	54				11-63	1200	33
24-63	0800	56				5-62	1630	58	28-65	1500	41				5-64	0950	32
25-64	0830	54				3-65	1100	52							22-64	1330	33
8-65	1800	59				28-65	1500	46							3-65	1230	37

219. Boulder Creek at Maxville, Mont. (12-3300)

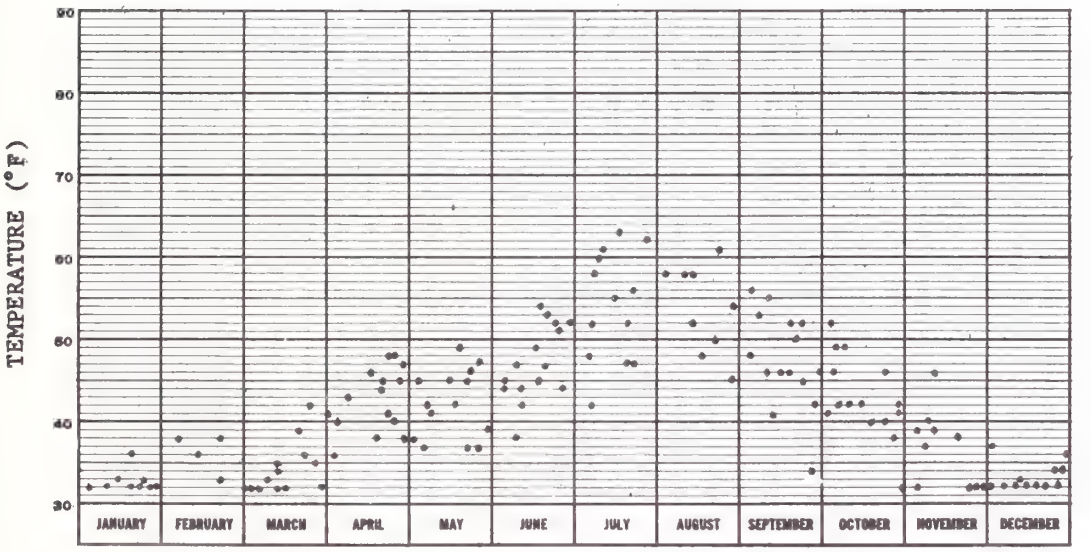
Location.--At gaging station, lat 46°28'30", long 113°14'00", in SW¼ sec.4, T.8 N., R.13 W., on right bank an eighth of a mile upstream from mouth and three-quarters of a mile north of Maxville. Altitude of gage is 4,750 ft (from topographic map).

Drainage area.--71.3 sq mi.

Water temperature records available.--151 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1939-65: Maximum, 764 cfs June 13, 1953; minimum, 3.0 cfs about Mar. 25, 1964.

Water temperatures 1949-65: Maximum observed, 63°F July 20, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

219. Boulder Creek at Maxville, Mont. (12-3300)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
24-51	1730	36	14-57	1050	36	13-50	1035	32	24-49	1530	44	18-49	1830	42	16-49	1130	47
29-53	1130	32	23-63	1630	38	20-51	1720	39	18-50	1530	46	24-50	1000	37	22-50	1530	44
23-54	1030	32	23-64	1200	33	4-52	1300	32	27-51	0930	48	15-51	1700	45	14-51	1720	49
29-55	1330	32	5-65	1430	38	11-53	1000	35	2-52	1500	36	7-52	1615	42	18-52	1715	53
12-56	1000	32				2-54	1200	32	22-53	0940	38	23-54	1450	46	8-54	0730	38
28-58	1600	32				29-54	1530	32	27-54	0830	40	2-57	0900	38	15-56	1205	54
26-59	1430	33				11-55	1200	32	30-56	1805	38	8-57	0800	41	4-57	0750	45
17-61	1620	33				26-57	0900	35	29-59	0930	45	20-58	1700	49	9-60	1035	44
25-62	1700	32				11-59	1030	34	6-60	1350	43	4-60	1510	45	14-61	0900	45
4-63	1600	32				9-60	1100	33	6-61	1425	43	5-61	1000	37	21-62	1900	51
29-63	1830	32				9-61	1020	33	24-62	1530	45	25-61	1500	47	4-63	1700	44
29-64	1400	32				22-62	1730	36	26-63	1900	48	30-61	0825	39	20-63	1700	52
						25-63	1630	42	3-64	1330	40	23-62	1630	46	9-64	1800	42
						1-65	1500	32	30-64	1230	47	22-63	1900	45	29-64	1630	52
									1-65	1330	41	22-64	1000	37	8-65	1700	47
									26-65	1100	41						
July			August			September			October			November			December		
18-50	1500	55	12-49	1030	48	15-49	1200	46	28-49	1730	42	29-50	1530	32	8-49	1600	32
24-52	1050	52	10-54	1300	52	19-50	1130	45	24-51	0850	38	27-51	1400	32	28-50	1450	36
7-54	0900	42	21-56	1000	50	17-51	1130	50	21-52	0900	40	26-52	0820	32	23-52	1030	32
28-55	1700	62	8-57	1430	58	18-52	1800	52	6-54	0900	42	10-53	1300	46	9-53	1330	33
12-56	1730	61	3-59	1400	58	8-54	0830	46	7-55	1600	49	8-54	1230	40	15-54	1100	32
11-57	1655	60	22-61	1700	61	8-55	1530	55	9-56	1200	42	9-55	1000	39	23-58	1400	34
10-58	1730	58	28-63	1600	54	3-57	0800	56	16-56	0930	40	5-60	1050	37	1-60	1510	32
7-59	1500	48	28-64	0930	45	30-57	1200	46	22-58	1400	46	20-62	1600	38	13-61	1330	32
20-60	1425	63	10-65	1300	58	16-58	1500	52	4-59	1600	46	7-63	1600	37	11-63	1100	32
10-61	1900	58				10-59	0900	41	5-60	1525	49	5-64	1530	39	5-64	1030	32
25-62	1600	56				13-60	1010	46	29-61	0930	32				24-64	1330	34
24-63	0700	47				24-61	0930	34	12-62	1530	42				3-65	1400	37
25-64	0900	47				5-62	1800	53	3-63	1630	52						
9-65	1100	52				3-65	1245	48	2-64	1030	41						
						28-65	1300	42	28-65	1330	41						

220. Middle Fork Rock Creek near Philipsburg, Mont. (12-3320)

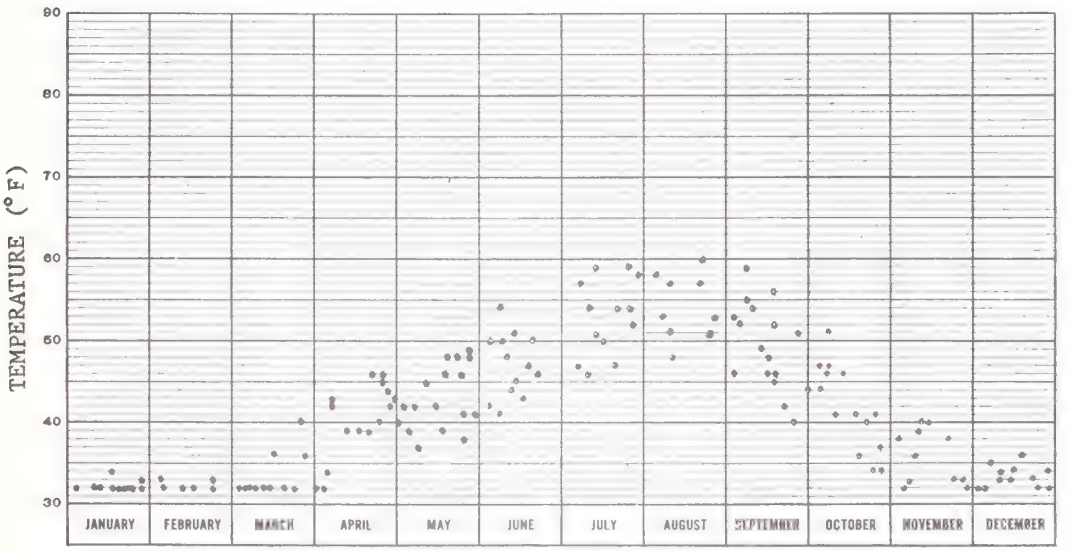
Location.--At gaging station, lat 46°12', long 113°30', in SE¼ sec.8, T.5 N., R.15 W., on right bank a quarter of a mile upstream from East Fork, 2½ miles upstream from West Fork, and 14 miles southwest of Philipsburg. Altitude of gage is 5,380 ft (from topographic map).

Drainage area.--123 sq mi.

Water temperature records available.--161 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1937-65: Maximum, 1,430 cfs June 13, 1953; minimum, 4.3 cfs Dec. 25, 1962.

Water temperatures 1949-65: Maximum observed, 60°F Aug. 22, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

220. Middle Fork Rock Creek near Philipsburg, Mont. (12-3320)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
17-50	1130	34	6-52	0945	32	9-49	1000	32	12-49	1300	39	17-49	1530	39	15-49	1100	45
24-51	1025	32	14-57	1445	32	20-51	0940	32	18-50	1100	39	23-50	1800	46	13-51	1050	44
29-53	1430	32	17-61	1305	32	4-52	1000	32	26-51	1400	45	15-51	1150	42	19-52	1215	47
22-54	1720	32	23-62	1400	32	11-53	1800	36	2-52	1000	32	7-52	0905	37	8-54	1315	41
29-55	1000	32	23-63	1330	33	2-54	1635	32	22-53	1230	46	23-54	0915	38	9-55	1000	50
12-56	1200	32	23-64	1600	32	10-55	1730	32	27-54	1640	44	1-56	0945	40	4-57	1150	50
11-57	1100	32	5-65	1030	33	26-57	1215	36	1-55	1500	32	2-57	1105	42	10-57	1245	48
29-58	0900	32				5-58	1315	32	15-58	0900	39	8-57	1445	45	9-60	1340	54
26-59	1135	32				9-61	1250	32	29-59	1030	42	8-57	1600	45	13-61	1800	51
17-61	1415	32				23-62	1100	32	6-60	1130	42	20-58	1200	48	21-62	1300	46
25-62	1230	32				25-63	1430	40	6-61	1700	43	25-58	1300	48	4-63	1400	42
4-63	1230	32				3-65	1440	32	24-62	1130	40	4-60	1230	39	20-63	1330	50
29-63	1530	32							26-63	1700	46	5-61	1255	42	9-64	1500	50
29-64	1100	33							3-64	1030	34	25-61	1910	49	18-64	1200	43
									30-64	0930	43	30-61	1035	41			
									1-65	1020	32	23-62	1330	41			
									26-65	1425	45	22-63	1630	48			
												19-64	1500	46			
July			August			September			October			November			December		
18-50	1100	47	11-49	0930	48	16-49	0930	46	28-49	1200	41	29-50	0930	32	9-49	1200	33
24-52	1425	54	10-54	1600	57	19-50	1500	45	26-50	1000	34	27-51	1130	33	28-50	1045	34
7-54	1800	57	21-56	1300	57	18-51	1100	52	24-51	1600	40	25-52	1040	33	28-51	1130	32
29-55	0900	58	8-57	1030	53	19-52	0905	46	21-52	1130	41	10-53	0900	40	22-52	1530	33
13-56	0900	50	4-59	0800	58	8-54	1320	55	6-54	1200	47	8-54	1600	39	9-53	1000	34
13-56	1000	50	22-61	1430	60	8-55	1200	59	7-55	1230	51	9-55	1200	40	16-59	1430	36
13-56	1100	50	28-63	1230	53	18-56	1440	56	16-56	1610	46	3-59	1530	38	2-60	1300	32
11-57	1435	59	27-64	1710	51	3-57	1130	53	22-58	1030	36	5-60	1305	32	12-61	1730	34
10-58	1200	54	10-65	1020	51	30-57	1500	51	4-59	1230	44	20-62	1230	38	11-63	1430	33
7-59	1130	47				16-58	1100	48	6-60	1200	46	7-63	1400	36	5-64	1210	35
21-60	1005	54				9-59	1500	54	29-61	1400	34	6-64	0910	33	24-64	1130	32
11-61	1000	51				13-60	1235	49	12-62	1200	41				3-65	0900	32
25-62	1200	52				24-61	1430	42	4-63	0900	47						
24-63	1100	54				5-62	1330	52	1-64	1415	44						
24-64	1500	59				3-65	0800	46	29-65	0800	37						
9-65	0840	46				28-65	0900	40									

221. Nevada Creek above reservoir, near Finn, Mont. (12-3355)

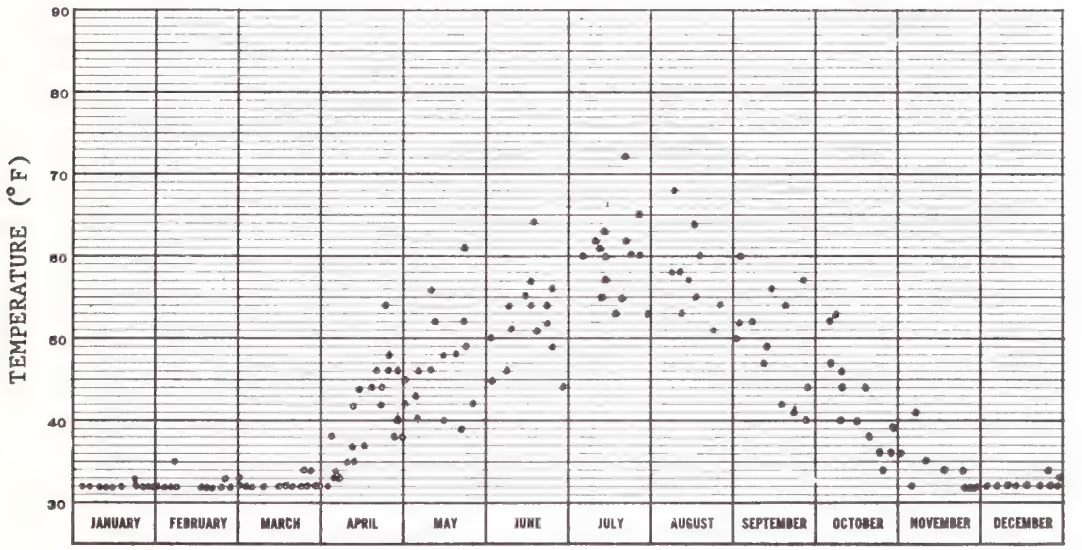
Location.--At gaging station, lat 46°46'30", long 112°45'20", near south line of sec.20, T.12 N., R.9 W., on right bank a quarter of a mile downstream from Gallagher Creek, 2 miles upstream from Buffalo Creek, and 3 miles west of Finn. Altitude of gage is 4,660 ft (from river-profile map).

Drainage area.--116 sq mi.

Water temperature records available.--166 spot observations made at time of discharge measurements during period April 1949 to December 1965.

Extremes.--Discharge 1939-65: Maximum, 1,800 cfs June 2, 1953; minimum, probably less than 2 cfs at times in 1944 and 1957.

Water temperatures 1949-65: Maximum observed, 72°F July 21, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

221. Nevada Creek above reservoir, near Finn, Mont. (12-3355)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
16-50	1300	32	25-49	1430	32	21-51	1355	32	11-49	1130	37	12-49	1500	56	13-49	1200	55
25-51	1425	32	5-52	1120	32	3-52	1200	32	17-50	0900	37	14-51	1100	40	20-50	0830	49
28-53	1300	32	3-55	1200	32	16-53	1330	32	27-51	1520	46	6-52	1000	43	14-51	1150	54
25-54	1200	32	20-56	1030	32	1-54	1100	32	18-52	1500	44	15-52	1330	48	17-52	1230	51
11-56	1000	32	6-57	1120	35	29-54	1200	32	23-52	1100	46	17-54	1035	48	7-54	1135	46
27-58	1200	32	27-57	1100	33	14-55	1230	32	21-53	1800	42	22-54	1345	49	8-55	1030	51
25-60	1120	32	6-61	0950	32	1-57	1030	33	26-54	1100	38	1-57	0900	42	14-56	1155	57
10-61	1015	32	22-62	1200	32	7-58	1545	32	30-56	0840	38	20-57	1515	39	2-57	1345	50
23-62	1600	33	6-63	1700	32	30-59	1030	32	11-57	1140	35	7-58	1230	46	8-60	1150	54
3-63	1430	32	21-64	1200	32	15-60	1415	32	27-59	1230	40	22-58	1400	61	16-61	1300	64
28-63	1600	32	1-65	1600	32	22-60	1600	34	11-60	1115	37	11-60	1040	46	20-62	1230	56
24-64	1100	32	28-65	1550	32	24-60	1715	34	5-61	1025	34	1-61	1055	45	19-63	0900	54
4-65	1000	32				2-61	1530	32	12-62	1600	42	22-62	1430	52	19-64	1400	52
8-65	1535	32				22-62	1200	32	14-62	1930	44	7-63	1500	40	2-65	0950	45
						1-63	1500	32	23-62	1700	54	13-64	1430	52	28-65	0950	44
									4-63	1100	38	24-64	0900	42			
									5-64	2000	33						
									10-64	1500	35						
									2-65	1515	32						
									6-65	1040	33						
									20-65	1430	46						
									21-65	1055	44						
									23-65	1250	48						
July			August			September			October			November			December		
12-49	1130	63	8-49	1030	58	13-49	1130	47	24-49	1130	34	27-50	1330	32	5-49	1200	32
17-50	0850	53	19-52	1010	55	21-51	1030	54	23-51	0950	36	26-51	1030	32	29-50	1255	33
22-52	1400	60	10-54	0900	53	18-52	1000	42	20-52	1030	44	24-52	1400	32	27-51	1200	32
6-54	1200	60	20-56	1330	64	7-54	1325	52	5-54	1300	47	4-53	1200	32	23-52	1300	32
28-55	1100	65	9-57	1500	68	2-57	1030	50	11-55	1130	46	5-54	1500	41	8-53	1130	32
12-56	1100	60	15-60	1430	57	27-57	1600	57	15-56	1130	40	8-55	1130	35	14-54	1200	32
12-57	0810	57	21-61	1030	60	17-58	1500	56	21-58	1100	38	1-60	1005	36	22-58	1000	34
11-58	1330	61	26-63	1030	54	14-59	1600	49	9-59	1200	40	28-60	1020	32	20-61	1300	32
11-59	1400	55	24-64	1030	51	23-61	1130	41	6-60	1725	53	19-62	1500	34	10-64	1510	32
31-59	0830	53	9-65	1130	58	4-62	1600	60	28-61	1100	36	12-63	1030	34	2-65	1300	32
21-60	1530	72				28-64	1020	44	11-62	1330	44						
10-61	1000	62				3-65	1700	52	5-63	1200	52						
24-62	1200	60				27-65	1015	40	29-65	1415	44						
19-63	1000	55															
20-64	1130	62															

222. Blackfoot River near Ovando, Mont. (12-3385)

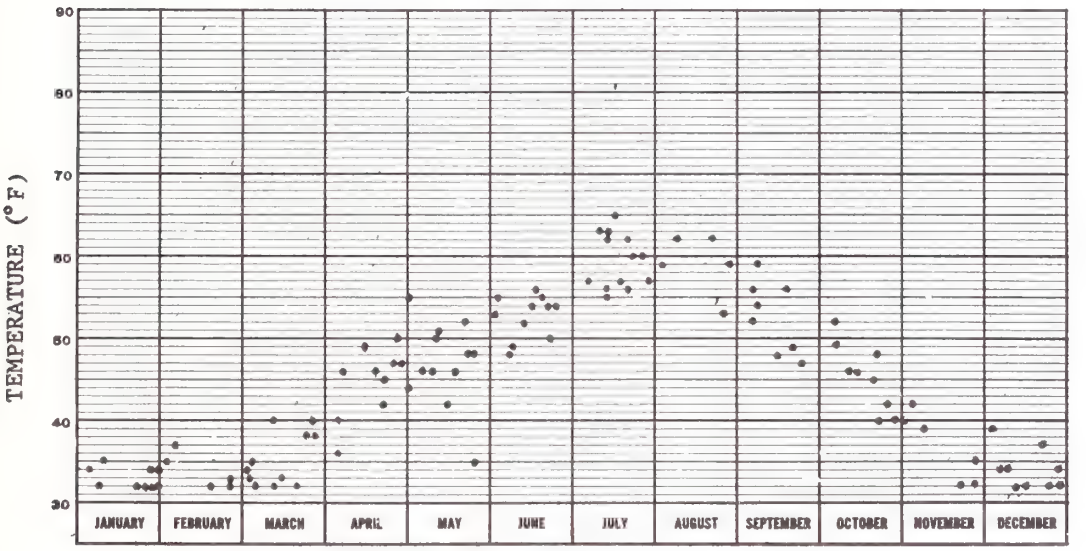
Location.--At gaging station, lat 47°01'10", long 113°13'40", in SE¼NW¼ sec.34, T.15 N., R.13 W., on left bank a quarter of a mile upstream from Monture Creek and 5 miles west of Ovando. Datum of gage is 3,917.27 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Drainage area.--1,274 sq mi.

Water temperature records available.--119 spot observations made at time of discharge measurements during period April 1949 to October 1963.

Extremes.--Discharge 1940-63: Maximum, 14,600 cfs June 4, 1953; minimum daily, 100 cfs Jan. 20, 1954.

Water temperatures 1949-63: Maximum observed, 65°F July 14, 1949; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-63

222. Blackfoot River near Ovando, Mont. (12-3385)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
23-51	1730	32	19-51	1500	32	11-49	1300	32	20-49	1200	42	10-49	1930	50	14-49	1530	54
30-53	1230	34	3-55	1500	35	14-50	1330	33	23-51	1530	44	14-51	1500	42	20-50	1630	54
25-54	1600	32	6-61	1135	37	19-51	1515	32	18-52	1300	46	6-52	1430	46	12-51	1420	52
9-57	1335	32	24-62	1630	32	3-52	1500	33	21-53	1630	45	16-52	1510	46	18-52	1300	55
27-58	1600	32	24-63	1600	33	11-53	1330	40	5-54	1300	36	22-54	1835	48	7-54	1600	48
27-59	1400	34				1-54	1615	32	26-54	1445	46	1-57	1500	44	8-55	1400	49
10-61	1225	35				27-57	1310	38	7-55	1430	46	9-57	1545	46	3-57	1440	55
5-63	1500	34				4-58	1400	35	14-58	1330	49	21-58	1700	52	2-60	1305	53
30-63	1330	32				5-60	0915	32	28-59	1500	47	11-60	1355	51	16-61	1000	56
						2-61	1350	34	7-60	1400	46	1-61	1345	55	22-62	1630	54
						24-62	1600	38	5-61	1245	40	24-62	1700	35	21-63	1600	50
						26-63	1030	40	25-62	1700	47	23-63	1230	48			
									27-63	1600	50						
July			August			September			October			November			December		
14-49	1930	65	8-49	1900	62	14-49	1500	48	25-49	1500	42	28-50	1400	32	6-49	1630	34
17-50	1430	57	19-52	1555	55	20-50	1300	49	23-51	1230	40	28-51	1330	35	27-50	1525	34
22-52	1945	60	28-53	1430	59	19-51	1300	54	20-52	1600	45	28-52	1415	32	27-51	1600	32
6-54	1730	57	24-54	1300	53	18-52	1430	55	5-54	1630	49	5-54	1330	42	24-52	1300	32
28-55	1430	57	20-56	1800	62	7-54	1620	56	11-55	1400	46	8-55	1500	39	8-53	1400	34
12-56	1500	63	3-59	1100	59	8-55	1830	59	21-58	1300	48	1-60	1210	40	14-54	1500	32
12-57	1100	62	21-61	1400	62	17-58	1130	56	28-61	1500	40	28-60	1205	32	11-56	1340	32
11-58	1030	56				8-60	1535	54	13-62	1230	46	21-62	1500	36	22-58	1430	37
11-59	1200	55				23-61	1530	47	5-63	1000	52				5-59	1410	39
20-60	1105	62				6-62	1530	57							14-61	1600	32
10-61	1400	63															
26-62	1500	60															
19-63	1200	56															

223. Blackfoot River near Potomac, Mont. (12-3398)

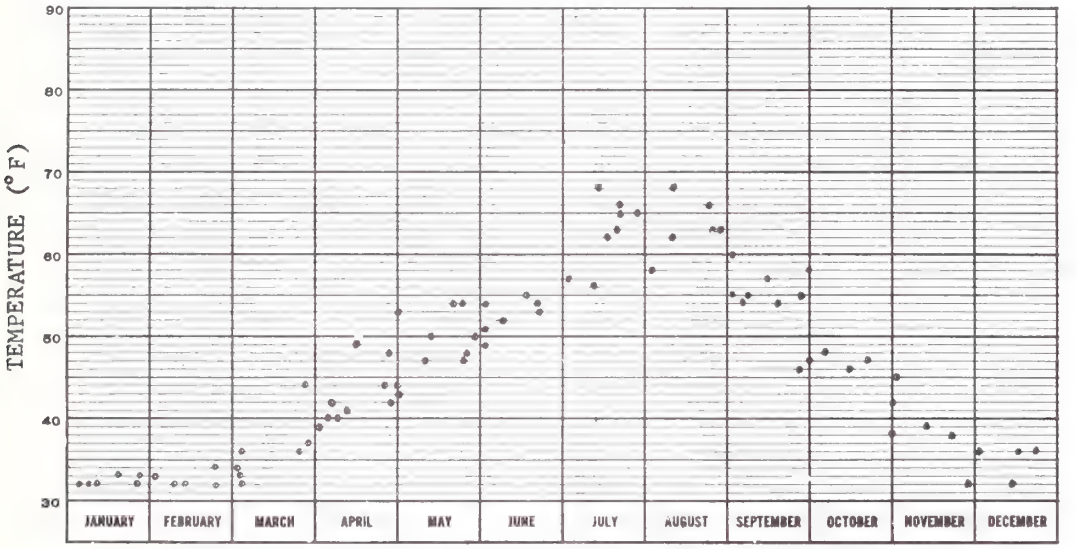
Location.--At gaging station, lat 46°57'10", long 113°34'00", in NE¼SW¼ sec.24, T.14 N., R.16 W., on right bank an eighth of a mile upstream from Belmont Creek, 5 miles north of Potomac, and at mile 21.3. Datum of gage is 3,533.36 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Drainage area.--2,046 sq mi.

Water temperature records available.--86 spot observations made at time of discharge measurements during period January 1957 to September 1965.

Extremes.--Discharge 1956-65: Maximum, 17,500 cfs June 10, 1964; minimum daily, 200 cfs Feb. 26, 1962.

Water temperatures 1957-65: Maximum observed, 68°F July 12, 1957, July 12, 1961, Aug. 9, 1965: minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1957-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-57	1335	32	9-61	1430	32	27-57	1130	37	14-58	1600	49	1-57	1605	43	3-57	1300	54
28-58	1000	32	24-62	1200	32	4-58	1600	36	28-59	1200	42	9-57	0945	47	2-60	1150	51
27-59	1200	33	24-63	1200	32	4-60	1600	32	7-60	1155	42	21-58	1500	54	8-60	1445	52
26-60	1055	32	2-64	1330	33	2-61	1145	34	11-60	1700	41	11-60	1700	50	16-61	0800	55
10-61	1435	32	24-64	1030	34	24-62	1200	36	5-61	1600	40	1-61	1650	53	22-62	1300	53
18-61	1305	33	11-65	1300	32	26-63	1430	44	25-62	1300	44	29-61	1350	50	21-63	1130	54
5-63	1030	32				3-65	1025	33	27-63	1030	48	24-62	1130	47	2-65	1330	49
8-65	1135	32							2-64	0930	39	23-63	1630	54			
									27-64	1130	42	25-64	1400	48			
									8-65	1000	40						
									30-65	1045	44						
July			August			September			October			November			December		
12-57	1430	68	9-57	1030	62	2-57	1600	60	21-58	1500	47	1-60	1420	42	22-58	1300	36
11-59	1000	56	3-59	0930	58	27-57	1130	55	5-60	1055	48	28-60	1355	32	15-59	1615	36
20-60	0830	65	23-61	1500	66	17-58	0930	54	31-61	1030	38	21-62	1100	38	14-61	1100	32
12-61	1500	68	26-63	1430	63	14-59	1100	57	13-62	0900	46	12-63	1330	39	2-64	1200	36
26-62	1130	65	24-64	1430	63	8-60	1345	55	1-64	0955	47	2-64	1330	45			
19-63	1500	63	9-65	1530	68	26-61	0930	46									
2-64	0900	57				6-62	1030	54									
15-64	1400	62				30-63	1200	58									
20-64	1430	66				2-65	0945	55									

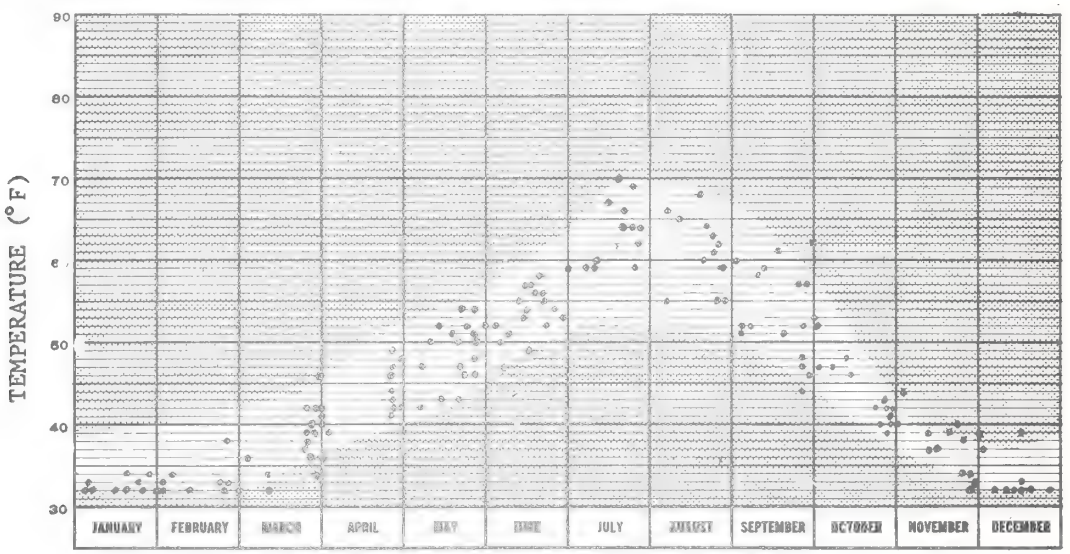
224. Blackfoot River near Bonner, Mont. (12-3400)

Location.--At gaging station, lat 46°53'50", long 113°45'20", near center of sec.9, T.13 N., R.17 W., on right bank 5 miles northeast of Bonner, 5 miles downstream from Union Creek, and 7 miles upstream from mouth. Datum of gage is 3,344.76 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Drainage area.--2,290 sq mi.

Water temperature records available.--184 spot observations made at time of discharge measurements during period March 1949 to December 1965. Thermograph records during period October 1955 to September 1959 published in reports of the Geological Survey.

Extremes.--Discharge 1898-1901, 1903-5, 1939-65: Maximum, 19,200 cfs June 10, 1964; minimum daily, 200 cfs Jan. 4, 5, 1950.
Water temperatures 1949-65: Maximum, 70°F July 23-25, 30, 1956, July 19, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.
The lines connect the highest and lowest monthly temperatures from thermograph record, 1955-59.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
23-53	1140	33	2-54	1300	32	11-49	1400	32	25-49	1100	41	9-49	1900	50	14-49	1900	57
5-54	1030	33	25-55	1400	32	4-50	1200	36	1-50	1230	41	6-50	1100	42	21-50	1250	55
25-55	1630	32	26-58	0900	33	28-51	1430	39	3-53	1400	39	23-50	1030	47	29-50	1620	53
4-56	1500	32	11-59	1000	32	1-53	0850	32	27-53	1530	49	8-51	1035	47	14-51	1830	54
27-56	1500	32	26-59	1300	33	27-54	1430	40	26-54	1400	47	28-53	1250	48	9-52	1500	51
23-58	0900	33	28-60	1330	32	29-55	1600	34	26-55	1230	44	26-54	1510	46	7-53	1305	47
14-59	1030	32	6-61	1600	34	27-56	1400	36	27-56	1630	46	18-56	1900	51	6-55	1430	50
18-60	1500	32	26-61	1245	38	26-57	1630	39	27-57	0930	42	21-56	1200	50	13-55	1625	53
18-61	1615	34	25-62	1000	32	26-58	0900	38	29-58	1000	42	7-57	1050	47	4-56	1400	52
6-63	1100	32	25-63	1130	32	11-59	0900	34	28-59	1300	44	27-57	1400	50	19-56	1500	56

224. Blackfoot River near Bonner, Mont. (12-3400)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
31-63	1700	32	24-64	1400	33	30-59	1400	42	1-60	1220	40	13-58	0830	43	17-57	1530	56
28-64	1430	34	2-65	1040	33	10-60	0800	32	29-61	1430	48	21-58	1330	54	18-58	1000	58
			26-65	1400	38	30-61	1600	46	26-62	1000	42	27-58	0830	54	4-59	1230	50
						25-62	0930	37	28-63	1000	47	20-59	0930	43	5-59	1330	50
						26-63	1730	42	26-64	1500	43	12-60	1315	52	15-61	1230	57
						30-64	0830	36	28-65	1415	47	31-60	1120	52	23-62	1000	54
						29-65	1430	42				26-61	0920	51	22-63	1000	52
												25-62	1000	46	15-64	1000	49
												24-63	1600	52	11-65	1300	55
												24-64	1430	46			
												25-64	1700	48			
												26-64	1400	50			
												28-65	1645	51			
July			August			September			October			November			December		
14-49	1700	67	9-49	1230	65	9-49	1230	58	26-49	1130	39	12-52	1230	37	7-49	1630	32
27-53	1630	64	27-52	1200	59	18-51	1030	51	24-51	0820	40	30-53	1700	39	12-52	1115	32
20-54	1800	66	24-54	1830	61	4-53	0825	51	7-52	1235	47	22-54	1330	40	15-54	1300	32
18-55	1800	67	24-55	1630	63	29-53	0845	46	29-53	0805	39	28-55	1300	34	27-56	1500	32
23-56	1600	69	27-56	1100	55	26-54	1830	57	26-54	1400	43	27-56	1230	34	19-57	1000	32
24-57	0800	59	19-57	1430	68	26-55	1700	44	11-55	1100	48	26-57	1100	38	10-58	1000	32
25-58	0900	62	21-58	0830	60	26-56	0740	48	23-56	1500	42	14-58	1000	37	15-59	1030	33
9-59	1500	59	6-59	0800	55	16-57	1730	61	30-57	1500	42	1-60	1640	40	13-61	1700	32
19-60	1645	70	23-61	1030	64	27-57	0930	52	1-58	1235	52	28-60	1610	32	15-63	1000	39
12-61	1000	60	26-63	1730	62	4-59	0900	52	29-59	1530	42	24-62	1430	34	2-64	1430	37
27-62	0900	62	25-64	0830	55	29-59	1400	46	30-61	1400	40	12-63	1530	39			
23-63	1030	64	6-65	1330	66	12-60	1240	59	13-62	1630	46	19-63	1230	39			
1-64	1600	59				30-60	1305	53	2-65	0800	47	19-63	1400	39			
21-64	0800	64				26-61	1500	47	28-65	0945	41	3-64	1130	44			
7-65	1000	59				7-62	1000	52				29-65	0800	33			
						30-63	1500	62									
						28-64	1430	57									
						2-65	1300	60									

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec.
1955	Max	--	--	--	--	--	--	--	--	--	52	41	37
	Min	--	--	--	--	--	--	--	--	--	39	33	32
1956	Max	39	40	39	47	54	61	70	67	60	52	40	36
	Min	32	34	33	37	43	50	52	51	47	38	33	32
1957	Max	40	37	42	52	53	63	69	69	64	58	41	36
	Min	33	32	33	38	44	52	56	55	48	37	35	32
1958	Max	36	34	44	49	56	63	69	69	65	54	41	34
	Min	32	32	33	37	43	52	54	53	47	38	33	32
1959	Max	37	34	44	48	50	58	67	63	63	--	--	--
	Min	32	32	32	40	42	48	54	52	44	--	--	--

Extremes for years 1955-59

Max	40	40	44	52	56	63	70	69	65	58	41	37
Min	32	32	32	37	42	48	52	51	44	37	33	32

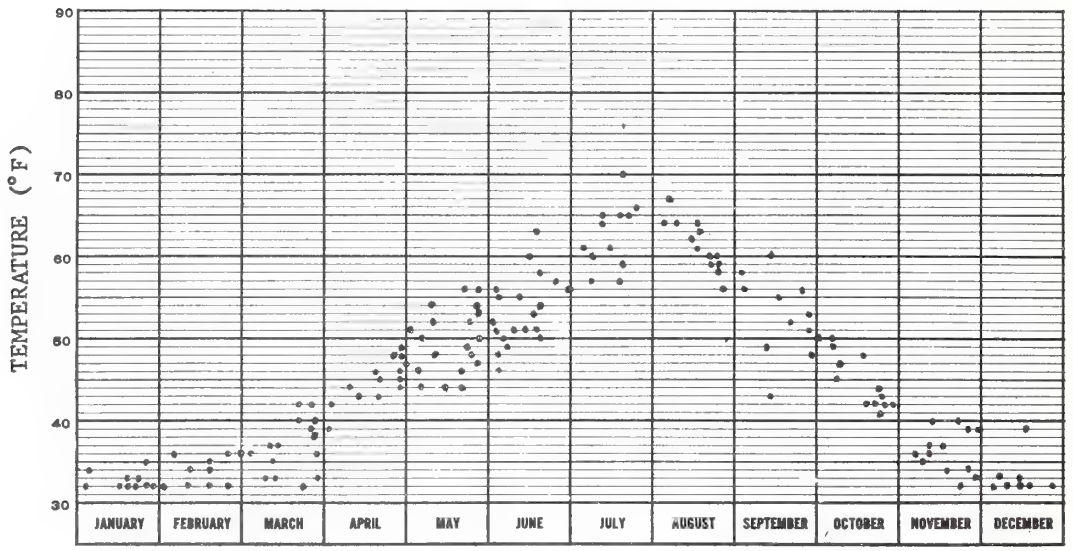
225. Clark Fork above Missoula, Mont. (12-3405)

Location.--At gaging station, lat 46°52'40", long 113°55'40", in NW¼NW¼ sec.19, T.13 N., R.18 W., on right bank 3.0 miles downstream from Blackfoot River, 3 miles east of Missoula, and at mile 361.6. Altitude of gage is 3,230 ft (from topographic map).

Drainage area.--5,999 sq mi.

Water temperature records available.--174 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1908, 1929-65: Maximum, 48,000 cfs during flood in June 1908; minimum, 115 cfs Oct. 25, 1943; minimum daily, 340 cfs Sept. 27, 1937.
Water temperatures 1949-65: Maximum observed, 70°F July 20, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

225. Clark Fork above Missoula, Mont. (12-3405)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
23-53	1415	35	28-53	1505	36	28-49	1530	36	28-49	1400	49	10-49	1200	52	4-53	1125	46
5-54	1330	34	2-54	1620	32	4-50	1700	36	2-53	1515	39	23-49	1630	49	7-53	0855	49
25-55	1330	32	25-55	1030	32	27-54	1700	40	28-53	0845	48	6-50	1500	44	19-53	1710	54
4-56	1030	32	26-58	1200	36	29-55	1300	33	26-54	1700	48	5-52	1130	46	6-55	1700	50
23-58	1130	32	11-59	1330	32	27-56	1700	38	26-55	1000	45	28-53	0845	50	16-55	1000	51
14-59	1230	32	7-61	1240	36	25-57	1730	39	27-56	1300	45	7-57	1530	50	19-56	1800	58
19-60	0930	32	19-62	1330	32	26-58	1100	42	27-57	1530	46	27-57	1600	53	17-57	1200	53
17-61	1430	33	12-63	1600	34	11-59	1200	35	28-58	1630	44	12-58	1700	48	17-58	1600	60
17-62	1130	32	19-64	1330	35	9-60	1700	33	28-59	1000	44	21-58	1600	56	18-58	0730	60
15-63	0830	32	19-65	1155	34	10-61	1130	37	13-60	1700	43	27-58	1130	56	30-58	1100	56
20-64	1630	33				21-61	1530	42	4-61	1800	42	20-59	1200	44	4-59	1600	51
18-65	1210	33				12-62	1630	33	19-62	1230	46	11-60	1345	54	3-60	1515	56
						14-63	1730	37	9-63	1700	44	2-61	1800	51	21-60	0955	50
						21-64	1000	40	20-64	1230	45	24-61	1300	52	5-61	1500	55
						22-65	1215	32	19-65	1530	43	26-61	1630	47	14-61	1500	55
									30-65	1730	47	14-62	1130	44	4-62	1400	48
												27-63	1700	54	26-62	1200	57
												24-64	1530	48	19-63	1700	63
												20-65	1215	46	2-64	1300	52
															19-64	1430	51
															3-65	1240	51
															10-65	0715	51
July			August			September			October			November			December		
12-49	1130	65	10-49	1130	64	3-53	1000	58	27-49	1000	42	12-52	1025	37	13-49	1600	32
17-52	1100	61	26-49	1900	60	28-53	1645	51	24-51	1030	42	30-53	1430	39	12-52	1215	32
6-53	1800	61	27-52	1530	59	26-54	1600	56	8-52	1100	49	22-54	1600	40	15-54	1020	33
20-54	1400	65	24-54	1600	59	28-55	1400	48	26-53	1640	42	28-55	1000	33	27-56	1200	32
18-55	1500	65	24-55	1300	60	16-57	1500	60	26-54	1700	41	26-56	1700	34	18-57	1700	32
23-56	1330	66	27-56	1330	58	4-59	1200	56	25-55	1530	44	25-57	1600	39	10-58	1200	33
24-58	1600	66	19-57	1200	64	29-59	1600	48	23-56	1700	42	14-58	1200	40	15-59	1230	32
9-59	1200	57	6-59	1100	64	23-60	0730	52	1-58	1700	50	23-59	1530	32	7-60	1055	32
20-60	1300	70	17-60	1230	62	28-62	1000	53	29-59	1230	42	10-60	1325	35	18-62	1100	39
13-61	1430	64	8-61	1000	67	19-63	1200	55	11-60	1600	47	7-61	1400	36	18-64	1245	32
18-63	0900	57	28-62	1000	56	17-64	1425	43	10-61	1300	45	29-61	1300	33	15-65	1200	32
9-64	0800	60	20-63	1830	63	15-65	1230	49	26-62	1030	43	17-62	1100	37			
19-65	1145	59	16-64	1700	62				21-63	1700	48	26-63	1330	39			
			18-65	1250	61				22-64	1155	42	18-64	1715	34			
									8-65	1000	50	12-65	1215	36			

226. Rattlesnake Creek at Missoula, Mont. (12-3410)

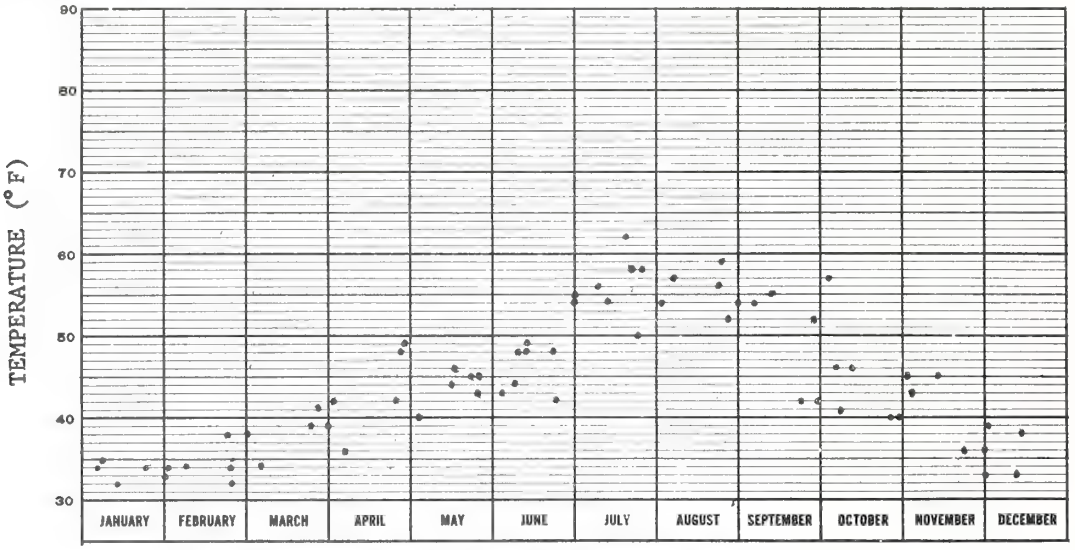
Location.--At gaging station, lat 46°52'20", long 113°59'00", in SW¼NE¼ sec.22, T.12 N., R.19 W., on upstream side of Vine Street Bridge in Missoula, half a mile upstream from mouth. Altitude of gage is 3,220 ft (from topographic map).

Drainage area.--79.7 sq mi.

Water temperature records available.--69 spot observations made at time of discharge measurements during period May 1958 to December 1965.

Extremes.--Discharge 1899, 1948, 1958-65: Maximum, 2,400 cfs June 6, 1948, at site 4 miles upstream; minimum observed, 0.1 cfs Feb. 24, 1964.

Water temperatures 1958-65: Maximum observed, 62°F July 19, 1960; minimum, freezing point at times in most winters.



Spot observations of water temperatures, 1958-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
13-61	1335	32	3-59	0830	34	6-59	0830	34	7-60	0745	36	16-58	1400	46	11-58	1500	48
6-63	0900	34	9-61	1135	34	1-61	1420	38	6-61	0830	36	3-59	1530	40	12-59	1530	49
24-64	1430	34	25-62	1300	32	23-62	1830	39	26-62	1400	42	15-61	1110	44	9-60	1500	48
7-65	0920	35	1-63	1200	33	27-63	1200	41	28-63	1700	48	26-61	1300	45	23-62	1500	42
			25-63	0930	34	31-65	1630	39	2-64	1300	42	25-62	1500	43	22-63	1530	48
			24-64	1600	38				29-64	1730	49	24-63	1400	45	8-64	2000	44
			2-65	1220	34										3-65	0845	43
															30-65	1445	54
July			August			September			October			November			December		
9-59	1730	56	2-59	1130	54	12-60	1345	55	8-59	1100	41	4-60	1710	43	16-59	0915	38
19-60	1805	62	23-61	2030	56	25-61	1700	42	6-60	0930	46	24-62	1700	36	1-60	1340	33
12-61	1800	54	28-63	0930	52	6-62	1930	54	30-61	1700	40	14-63	1530	45	14-63	1330	33
25-62	2000	58	24-64	1630	59	28-64	1635	52	12-62	1900	46	2-64	1600	45	2-64	1630	39
23-63	0800	50	6-65	1050	57	1-65	1815	54	3-63	1400	57				1-65	1500	36
1-64	1430	55				29-65	0800	42	28-65	0730	40						
21-64	1030	58															

227. West Fork Bitterroot River near Conner, Mont. (12-3425)

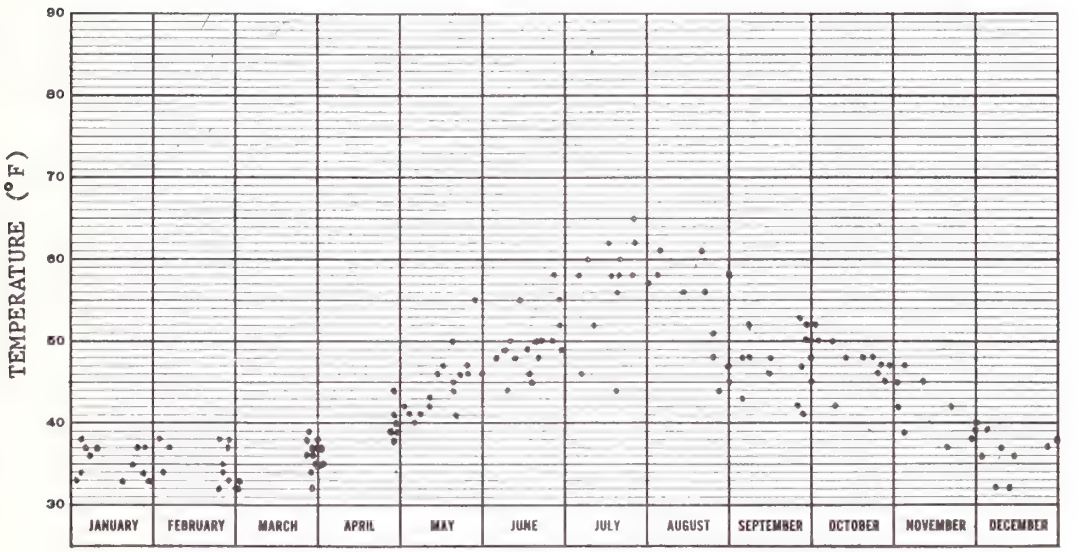
Location.--At gaging station, lat 45°43'30", long 114°16'50", in SE¼NE¼NW¼ sec.26, T.1 S., R.22 W., on right bank half a mile downstream from Painted Rocks Lake (formerly West Fork Bitterroot River Reservoir), 6 miles upstream from Nez Perce Creek, 16 miles southwest of Conner, and at mile 19.2. Altitude of gage is 4,580 ft (from topographic map).

Drainage area.--317 sq mi.

Water temperature records available.--165 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1941-65: Maximum, 4,060 cfs May 9, 1947; minimum, 0.2 cfs Nov. 25, 1942; minimum daily, 0.6 cfs May 3-7, 1954.
Water temperatures 1949-65: Maximum observed, 65°F July 29, 1953; minimum, freezing point at times during winter months.

Remarks.--Water temperatures affected by storage in Painted Rocks Lake. Water is drawn from bottom of lake except during high water periods.



Spot observations of water temperatures, 1949-65

227. West Fork Bitterroot River near Conner, Mont (12-3425)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
21-53	1200	33	27-50	1330	33	2-49	1100	33	26-51	1500	39	2-49	1300	42	28-49	1230	55
7-54	1100	37	25-53	1620	32	29-49	1130	34	2-52	1530	35	24-49	1100	45	22-50	0900	50
27-55	1000	37	4-54	1020	34	30-50	1200	35	1-53	1320	37	17-51	1150	46	28-50	1100	52
6-56	0930	38	26-55	1330	37	31-51	1100	35	28-54	1330	44	4-52	1100	41	12-51	1530	48
29-56	1100	37	27-59	0930	37	29-54	1000	32	28-55	1430	41	29-53	1200	55	10-52	1400	50
30-57	1300	33	7-61	1150	37	31-55	1530	38	29-57	0930	39	24-54	1455	50	9-53	1445	44
1-58	1200	33	27-61	1400	38	29-56	0930	37	28-59	1130	40	25-55	0830	41	18-53	1320	48
27-59	1000	37	26-62	1030	34	28-57	0900	36	27-61	0930	39	19-56	1200	47	14-55	1130	49
6-60	1130	34	4-63	1530	37	31-59	0900	37	29-62	1330	40	9-57	0805	41	5-56	1600	48
28-60	1035	34	27-63	1700	38	1-60	1025	32	29-63	1630	40	28-57	0900	47	20-56	1330	50
11-61	1220	37	26-64	1600	35	29-60	1130	37	28-64	1000	38	6-58	1500	40	18-57	0830	45
9-63	1530	36	3-65	1535	38	28-61	1430	39				13-58	1230	42	1-60	1220	46
26-64	1130	35	25-65	1445	38	28-62	1500	36				24-58	1330	44	15-61	0900	55
6-65	1425	37				28-63	1700	38				13-60	1105	43	26-62	1530	58
						30-65	0900	36				28-61	1700	47	25-63	1600	50
												28-62	1730	46	11-64	1430	44
												26-63	0800	46	17-64	1130	46
															9-65	1105	49
															29-65	0910	49
July			August			September			October			November			December		
28-49	1400	58	25-49	1500	56	17-52	1045	48	3-49	1530	50	4-49	1200	39	15-49	1400	32
14-50	1030	52	5-52	1000	61	1-53	1020	58	9-51	1200	50	20-51	1000	37	10-52	1025	32
9-52	1430	60	26-54	0930	51	28-54	0830	47	21-52	1020	48	23-54	1730	42	1-53	1000	40
29-53	1730	65	23-55	1430	61	28-55	1930	41	2-53	1400	52	29-55	0930	38	17-54	0930	36
22-54	0900	44	28-56	1330	44	27-56	0830	42	27-53	1200	47	28-56	0900	38	28-56	1600	37
20-55	1400	62	19-57	2000	56	17-57	0900	46	28-54	0830	45	2-60	1215	45	31-58	1030	38
24-56	0730	60	1-59	1200	57	9-58	0930	52	26-55	1600	46	29-60	1210	38	2-59	1135	36
23-57	0800	58	26-61	1500	51	1-59	0900	45	24-56	1500	48	2-61	1530	42	18-61	1600	36
7-59	0830	46	26-64	1130	48	1-59	1130	45	30-57	1430	47	29-62	1500	38	13-63	1130	37
6-60	1135	58	4-65	1400	58	7-60	1225	48	10-58	1000	42	13-63	1130	45	4-64	1530	39
29-62	1400	62	31-65	1305	47	28-60	1220	53	1-59	0930	50	4-64	1310	47			
21-63	0830	58				29-61	1500	50	16-62	1000	48	30-65	0900	39			
23-64	1030	56				9-62	1530	48	1-63	1000	45						
						5-63	1030	43	26-65	0830	46						
						29-64	1030	52									
						30-65	1645	48									

228. East Fork Bitterroot River near Conner, Mont. (12-3434)

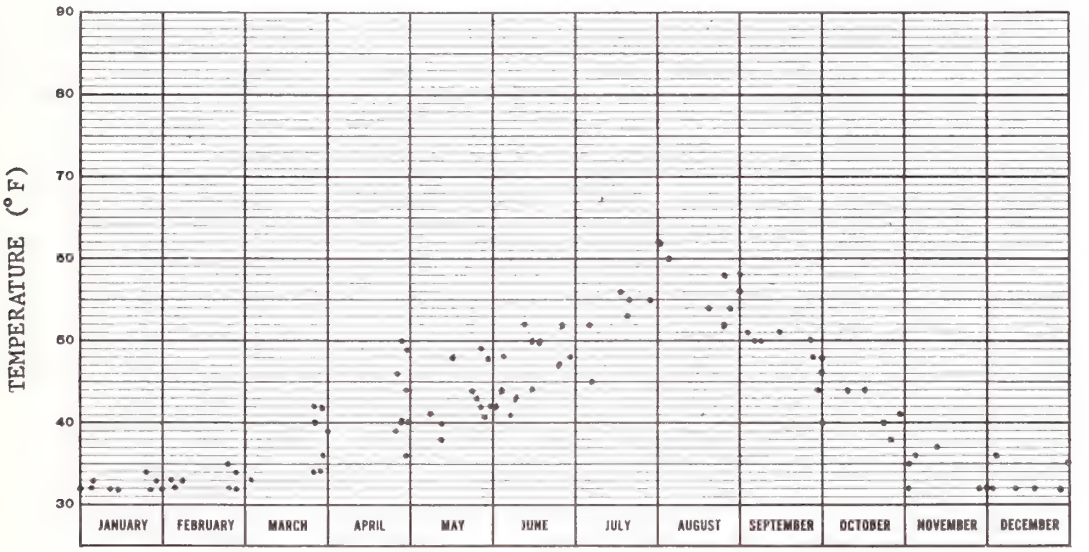
Location.--At gaging station, lat 45°53'00", long 114°03'50", in NE¼ sec.34, T.2 N., R.20 W., on right bank 10 ft downstream from private bridge, 4½ miles southeast of Conner, and 5 miles upstream from confluence with West Fork. Datum of gage is 4,191.81 ft above mean sea level, datum of 1929, Pacific Northwest supplementary adjustment of 1947.

Drainage area.--381 sq mi.

Water temperature records available.--105 spot observations made at time of discharge measurements during period April 1956 to December 1965.

Extremes.--Discharge 1956-65: Maximum, 3,270 cfs June 8, 1964; minimum observed, 23 cfs Nov. 29, 1960.

Water temperatures 1956-65: Maximum observed, 62°F Aug. 1, 1959; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1956-65

228. East Fork Bitterroot River near Conner, Mont. (12-3434)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-57	1630	32	29-60	1150	32	28-57	1400	42	29-56	1200	40	19-56	1600	48	5-56	1830	48
1-58	1430	32	7-61	1040	33	3-59	0930	33	29-57	1330	49	9-57	1110	41	20-56	1700	50
28-59	1130	33	27-61	1240	32	31-59	1230	39	29-58	1000	40	28-57	1300	48	18-57	1200	50
6-60	1000	32	26-62	1530	32	29-60	0950	34	28-59	1630	50	13-58	1000	40	8-59	1000	41
27-60	1430	32	4-63	1200	32	28-61	1200	40	27-61	1200	46	24-58	1000	44	1-60	1020	42
11-61	1055	32	27-63	1130	34	28-62	1200	34	29-62	1200	36	13-60	0900	38	15-61	1130	52
9-63	1200	32	26-64	1300	32	28-63	1200	40	29-63	1330	44	27-61	1600	49	26-62	1230	52
26-64	1300	34	3-65	1120	33	30-64	1630	42	28-64	0800	40	29-62	1130	42	25-63	1230	47
6-65	1020	33	25-65	1220	35	30-65	1110	36	27-65	1020	39	26-63	1100	42	4-64	1430	44
												25-64	0900	43	11-64	1100	43
												27-65	0950	41	11-64	1230	43
															17-64	0930	44
															9-65	0910	43
															29-65	1245	48
July			August			September			October			November			December		
23-57	1030	55	28-56	1230	54	27-56	1400	50	24-56	1300	40	28-56	1200	32	28-56	1330	32
7-59	1030	45	20-57	0800	54	17-57	1100	51	30-57	0935	41	2-60	1025	35	31-58	1300	35
6-60	0925	52	1-59	1430	62	1-59	1330	58	10-58	1200	44	29-60	1050	32	2-59	0945	32
29-62	1030	55	26-61	1130	58	7-60	1040	50	1-59	1130	40	2-61	1130	32	18-61	1300	32
21-63	1030	56	26-64	1000	52	28-60	1040	48	16-62	1330	44	29-62	1130	32	13-63	1000	32
23-64	0900	53	4-65	1600	60	29-61	1230	46	1-63	0830	48	13-63	0930	37	4-64	1345	36
			31-65	1455	56	9-62	1230	50	26-65	1100	38	4-64	0930	36			
						5-63	0900	51				30-65	1100	32			
						29-64	0845	44									
						30-65	1400	46									

229. Bitterroot River near Darby, Mont. (12-3440)

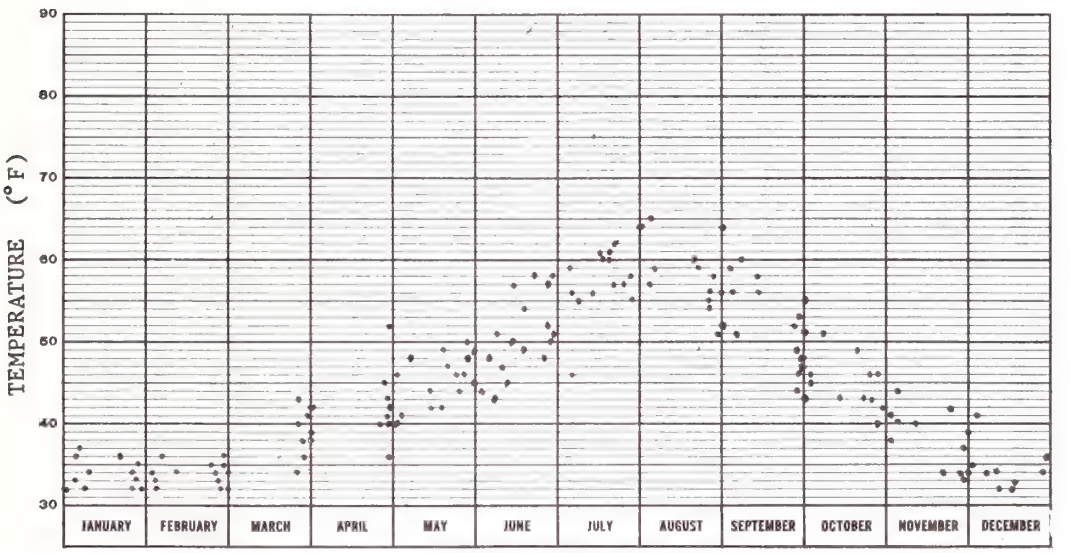
Location.--At gaging station, lat 45°58'20", long 114°08'20", in E½ sec.36, T.3 N., R.21 W., on left bank 25 ft downstream from bridge on U. S. Highway 93, a quarter of a mile downstream from Chaffin Creek, 4 miles southeast of Darby, and at mile 77.2. Datum of gage is 3,943.14 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Drainage area.--1,049 sq mi.

Water temperature records available.--175 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1937-65: Maximum, 11,500 cfs May 9, 1947; minimum observed, about 71 cfs Feb. 9, 1939.

Water temperatures 1949-65: Maximum observed, 65°F Aug. 5, 1952; minimum, freezing point at times during winter months.



Spot observations of water temperatures, 1949-65

229. Bitterroot River near Darby, Mont. (12-3440)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
26-50	1630	32	28-50	1630	34	30-49	1600	38	26-51	1130	40	3-49	1630	41	28-49	1000	50
21-53	1530	36	25-53	1530	34	30-50	1530	38	1-53	1640	42	25-49	1130	44	22-50	1430	58
7-54	1530	37	4-54	1445	33	31-51	1400	38	28-54	1100	43	17-51	1845	42	27-50	1600	57
27-55	1200	33	26-55	1630	33	29-54	1330	36	27-55	1700	45	2-52	1600	46	12-51	0730	45
6-56	1230	33	14-57	1100	34	31-55	1800	38	29-56	1000	42	1-53	1455	40	10-52	0700	47
29-56	1400	32	27-59	1230	36	29-56	1300	38	29-57	1600	52	20-53	1615	47	3-53	1700	44
30-57	1700	32	28-60	1630	32	28-57	1500	43	29-58	1300	42	24-54	1030	46	18-53	1810	49
1-58	1600	32	7-61	1305	36	31-59	1100	39	28-59	1500	42	19-56	1500	49	7-55	0900	43
28-59	1030	35	27-61	1515	35	31-60	1515	38	28-61	0930	42	8-57	1740	48	14-55	1730	50
6-60	1345	33	26-62	1400	32	28-61	1630	40	29-62	0930	36	28-57	1600	50	5-56	1200	48
27-60	1540	33	4-63	1000	32	28-62	1000	34	29-63	1100	40	13-58	1600	44	18-57	1500	54
11-61	1405	34	27-63	0900	35	28-63	1000	40	27-64	1630	45	24-58	1600	44	8-59	1230	43
9-63	1000	32	27-64	0900	32	30-64	1130	41	28-65	0720	41	31-59	1330	45	15-61	1430	57
26-64	1500	34	3-65	0830	34	28-65	1230	36				13-60	1325	42	28-61	1340	58
6-65	1050	36	24-65	1355	35							31-60	1640	49	26-62	0830	52
												27-61	1800	46	25-63	1030	48
												29-62	0830	48	9-65	1150	51
												26-63	1330	46	29-65	1335	51
												24-64	1830	44			
												27-65	1015	46			
July			August			September			October			November			December		
27-49	1730	57	25-49	0930	55	17-52	1600	56	3-49	1100	45	4-49	1600	40	14-49	1500	32
15-50	1325	56	30-50	1210	51	1-53	1530	64	3-50	1630	46	20-51	1300	34	10-52	1430	34
9-52	1030	55	5-52	1400	65	28-54	1100	49	9-51	1430	51	23-54	1530	42	1-53	1330	39
29-53	1130	58	26-54	1200	54	28-55	0930	44	22-52	1730	49	29-55	1200	34	17-54	1200	32
22-54	1430	60	23-55	1100	59	27-56	1400	52	1-53	1545	51	28-56	1300	34	28-56	1230	34
20-55	0830	61	28-56	1500	58	17-57	1330	58	28-53	1430	46	2-60	1355	41	31-58	1430	36
6-56	1400	59	20-57	1100	60	9-58	1230	60	28-54	1130	40	29-60	1335	33	2-59	1335	35
24-56	1230	62	7-58	1130	59	29-58	1400	53	26-55	1300	43	2-61	0930	38	18-61	1000	33
23-57	1230	60	1-59	1600	64	1-59	1430	52	4-56	0915	46	29-62	0930	37	13-63	1500	34
7-59	1200	46	26-61	0930	56	30-59	1500	48	24-56	1100	43	13-63	1300	40	4-64	1200	41
7-60	0950	56	26-64	0830	55	7-60	1405	56	30-57	1200	42	4-64	1010	44			
29-62	0900	55	5-65	0850	57	30-60	0935	47	16-62	1530	43	30-65	1300	34			
21-63	1200	60	31-65	1700	56	29-61	1030	46	1-63	1130	55						
23-64	1300	61				9-62	0930	51	1-65	0830	43						
24-64	0800	57				5-63	1230	59	26-65	1230	46						

230. Rock Creek near Darby, Mont. (12-3450)

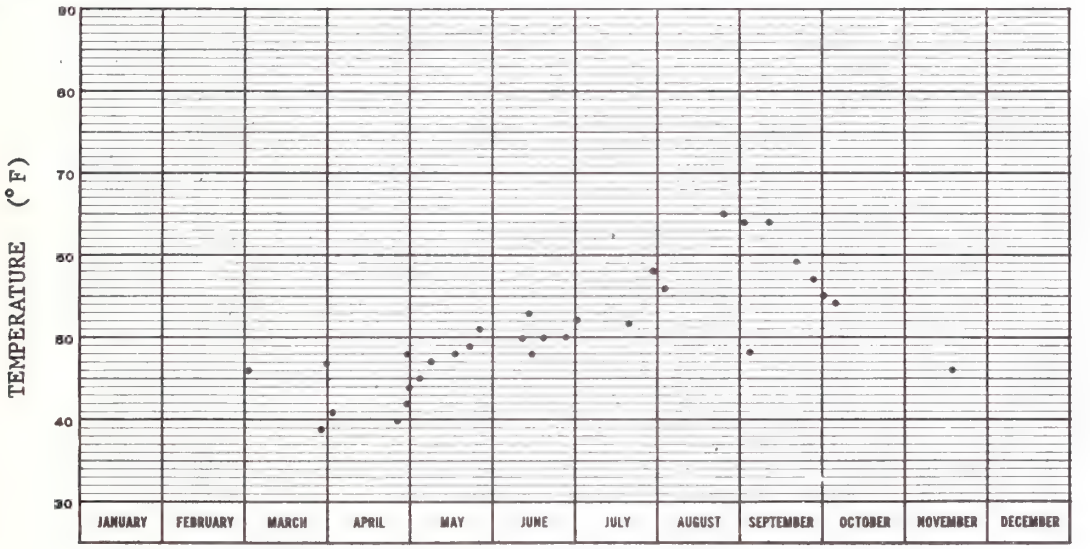
Location.--At gaging station, lat 46°04'10", long 114°13'20", in SE¼SE¼ sec.29, T.4 N., R.21 W., on left bank 0.6 mile downstream from Como Lake, 0.7 mile upstream from Rock Creek Canal, and 4 miles northwest of Darby. Altitude of gage is 4,070 ft (from topographic map).

Drainage area.--55.4 sq mi.

Water temperature records available.--32 spot observations made at time of discharge measurements during periods May 1949 to September 1953, September 1957 to September 1959 (no winter temperatures).

Extremes.--Discharge 1946, 1948-53, 1957-59: Maximum, 1,580 cfs June 17, 1950; no flow at times owing to regulation.
Water temperatures 1949-53, 1957-59: Maximum observed, 65°F Aug. 24, 1949; minimum observed, 39°F Mar. 21, 1951.

Remarks.--Water temperatures affected by storage in Como Lake.



Spot observations of water temperatures, 1949-53, 1957-59

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						1-50	1600	46	24-50	1030	40	3-49	1130	45	30-49	0930	52
						31-50	1500	47	29-53	1645	48	25-49	1500	51	27-50	1100	50
						29-51	1430	39	29-58	1630	42	9-51	1800	47	13-51	0905	48
									1-59	1230	41	21-53	1615	49	11-52	1100	53
									30-59	1000	44	14-58	1400	48	9-53	1650	50
															16-53	1505	50
															12-58	1330	48
July			August			September			October			November			December		
18-50	1050	52	24-49	1630	65	18-52	1005	59	4-49	1200	54	16-49	--	46			
30-53	1800	58	2-59	1130	56	1-53	1830	64									
						30-53	--	55									
						25-57	1030	57									
						9-58	1630	64									
						3-59	0900	48									

231. Skalkaho Creek near Hamilton, Mont. (12-3465)

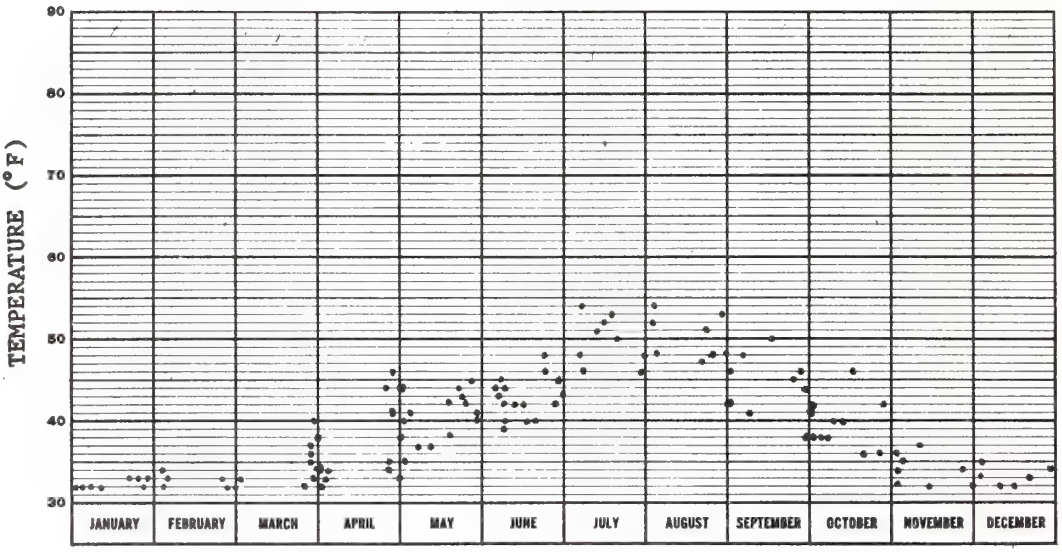
Location.--At gaging station, lat 46°09'50", long 113°57'00", in NE¼ sec.27, T.5 N., R.19 W., on right bank 2 miles downstream from Daly Creek, 12 miles southeast of Hamilton, and at mile 12.0. Altitude of gage is 4,490 ft (from topographic map).

Drainage area.--87.8 sq mi.

Water temperature records available.--122 spot observations made at time of discharge measurements during periods March 1949 to September 1953, September 1957 to December 1965.

Extremes.--Discharge 1948-54, 1957-65: Maximum, 935 cfs May 20, 1954; minimum recorded, 10 cfs Apr. 2, 1953.

Water temperatures 1949-53, 1957-65: Maximum observed, 54°F July 10, Aug. 4, 1952; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1957-65

231. Skalkaho Creek near Hamilton, Mont. (12-3465)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
28-50	1130	32	26-53	1015	32	2-49	1600	33	4-49	1030	34	4-49	1200	41	24-49	1430	48
22-53	0940	33	7-61	1440	33	1-50	1130	32	27-50	1000	34	25-49	1800	44	21-50	0840	40
2-58	1800	32	28-61	1020	32	29-50	1730	35	28-51	1630	41	9-51	0900	37	28-50	0830	42
29-59	1130	33	28-62	1000	32	31-59	1700	38	3-52	1030	33	2-52	1910	40	13-51	1130	42
28-60	1320	32	5-63	1000	32	29-60	1405	37	2-53	0945	32	1-53	1600	38	10-52	1730	44
12-61	1005	32	28-63	1600	32	29-61	1100	36	27-61	1830	44	20-53	1030	38	9-53	1020	39
8-63	1600	32	27-64	1200	32	27-62	1030	32	30-62	0900	33	1-59	1500	44	10-53	1010	40
25-64	1500	33	4-65	1400	34	30-63	1500	40	1-64	1330	34	30-59	1530	41	18-53	1010	40
5-65	1100	32	24-65	1500	33	30-65	1330	33	28-64	1530	46	14-60	1045	37	7-59	1100	43
									27-65	1600	45	30-61	0900	40	6-60	1800	44
												27-62	1600	42	16-61	1930	42
												2-63	0930	35	27-62	0930	42
												28-63	1600	45	24-63	1830	46
												20-64	1800	42	10-64	1600	42
												26-65	1730	43	30-64	0900	43
															9-65	1800	45
															29-65	1800	45
July			August			September			October			November			December		
18-50	1615	52	24-49	1300	47	18-52	1525	50	6-49	1000	38	3-49	1700	34	9-52	1130	32
16-51	0805	51	30-50	1630	53	2-53	1100	46	2-50	1435	38	19-51	1700	32	30-58	1500	34
10-52	1800	54	4-52	1630	54	25-57	1400	45	9-51	1200	40	2-60	1645	36	3-59	1000	33
31-53	0900	48	3-59	1200	52	7-60	1615	48	23-52	1000	36	30-60	1015	32	17-61	1100	33
9-59	1800	46	31-59	1600	48	28-60	1445	46	1-53	0910	41	3-61	0900	32	12-63	1300	32
8-60	1010	48	27-61	0930	48	30-61	1030	38	29-57	1030	42	27-62	1800	34	3-64	1500	35
30-62	0900	46	25-64	1700	51	10-62	1000	41	12-58	1030	40	13-63	1530	37			
20-63	1730	53	5-65	1100	48	29-64	1430	44	4-59	1030	38	5-64	0930	35			
22-64	1030	50				1-65	0815	42	17-62	0930	46	29-65	1300	32			
									2-63	0830	42						
									1-65	1315	41						
									27-65	0800	36						

232. Blodgett Creek near Corvallis, Mont. (12-3475)

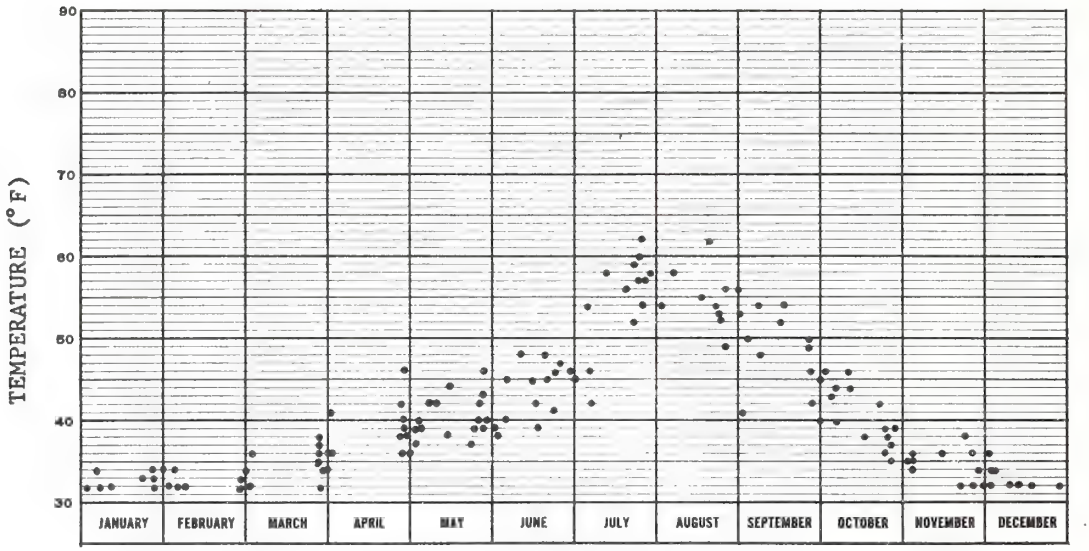
Location.--At gaging station, lat 46°16'10", long 114°14'10", in NW¼NW¼ sec.21, T.6 N., R.21 W., on right bank 4½ miles upstream from mouth and 7 miles southwest of Corvallis. Altitude of gage is 4,050 ft (from topographic map).

Drainage area.--26.4 sq mi.

Water temperature records available.--162 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1946-65: Maximum, 836 cfs May 16, 1949; minimum, 1.2 cfs Nov. 9, 10, 23, 25, 1952.

Water temperatures 1949-65: Maximum observed, 62°F July 24, 1956, Aug. 20, 1957; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

232. Blodgett Creek near Corvallis, Mont. (12-3475)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
27-50	1600	32	26-53	1255	33	31-49	1200	36	28-51	1300	39	4-49	1700	40	29-49	1430	46
22-53	1200	33	5-54	1000	32	3-50	1530	36	30-53	0950	36	26-49	1130	40	21-50	1410	45
6-54	1500	34	27-55	1100	33	29-50	1500	36	27-54	1830	42	1-50	1530	39	28-50	1450	46
26-55	1500	34	8-61	1005	32	31-53	1630	36	27-55	1400	38	16-51	1445	44	9-52	1800	48
5-56	1430	34	28-61	1200	33	28-54	1700	32	28-56	1430	40	3-52	1015	39	3-53	1015	38
28-56	1700	32	27-62	1730	32	30-55	1600	34	28-57	1500	46	21-53	0945	37	17-53	1700	45
2-58	1500	32	2-63	1030	32	28-56	1530	37	1-59	1500	41	25-54	1130	40	15-55	0735	39
31-59	1530	34	28-63	1030	34	27-57	1500	38	27-61	1500	42	24-55	1800	39	6-56	1030	40
26-60	1500	32	27-64	1500	33	1-60	1435	32	27-62	1000	36	25-56	1600	42	21-56	0830	41
12-61	1150	32	4-65	1050	34	29-60	1540	36	1-64	1000	36	8-57	1530	42	18-57	1700	48
7-63	1030	32				27-61	1630	37	29-64	0800	39	28-57	1930	46	1-59	0830	39
27-64	1200	33				27-62	1430	35	29-65	0905	38	10-58	1700	42	7-60	1230	45
5-65	1425	34				30-63	1000	36				2-59	0900	37	14-61	0830	42
						2-65	1055	32				14-60	1230	38	25-62	1500	47
						31-65	0935	34				28-61	0900	43	24-63	1530	46
												27-62	1100	39	30-64	1100	45
												1-63	1430	39			
												27-63	0900	39			
												29-63	0900	40			
												21-64	0900	37			
												28-65	0905	39			
July			August			September			October			November			December		
26-49	0930	54	24-49	1030	53	1-50	1020	53	5-49	1130	44	3-49	1400	34	17-49	1200	32
28-53	1900	57	6-52	1030	58	16-52	1650	52	9-51	1400	46	21-51	1000	32	9-52	1505	32
21-54	1830	42	31-53	1900	56	27-54	1530	50	21-52	1750	42	23-54	1330	38	1-53	1600	36
19-55	1800	56	25-54	1700	52	27-55	1500	46	3-53	1700	43	29-55	1500	34	16-54	1430	32
24-56	1530	62	23-55	0900	54	27-56	1530	50	27-53	1700	37	27-56	1630	32	28-56	1030	32
23-57	1430	60	27-56	1700	53	17-57	1500	54	27-54	1600	35	3-60	0955	35	1-59	1445	34
12-58	1630	58	20-57	1400	62	4-59	1500	50	26-55	1030	38	30-60	1145	32	17-61	1530	32
8-59	0800	42	1-59	0830	54	27-60	1830	49	25-56	0900	36	1-61	0930	35	12-63	1500	32
5-60	1450	54	17-60	1445	55	28-61	1430	42	29-57	1200	39	27-62	1500	36	4-64	1020	34
30-62	1530	58	27-61	1100	56	10-62	1330	48	12-58	1700	44	14-63	0930	36	1-65	1000	32
21-63	1630	59	26-64	1530	53	7-63	0930	54	5-59	0900	40	5-64	1115	36			
22-64	1300	57	27-64	0930	49	30-64	--	45	15-62	1000	38						
8-65	0905	46	5-65	1550	58	1-65	1350	41	2-63	1000	46						
						30-65	0940	40	25-65	1700	39						

233. Bitterroot River near Corvallis, Mont. (12-3482)

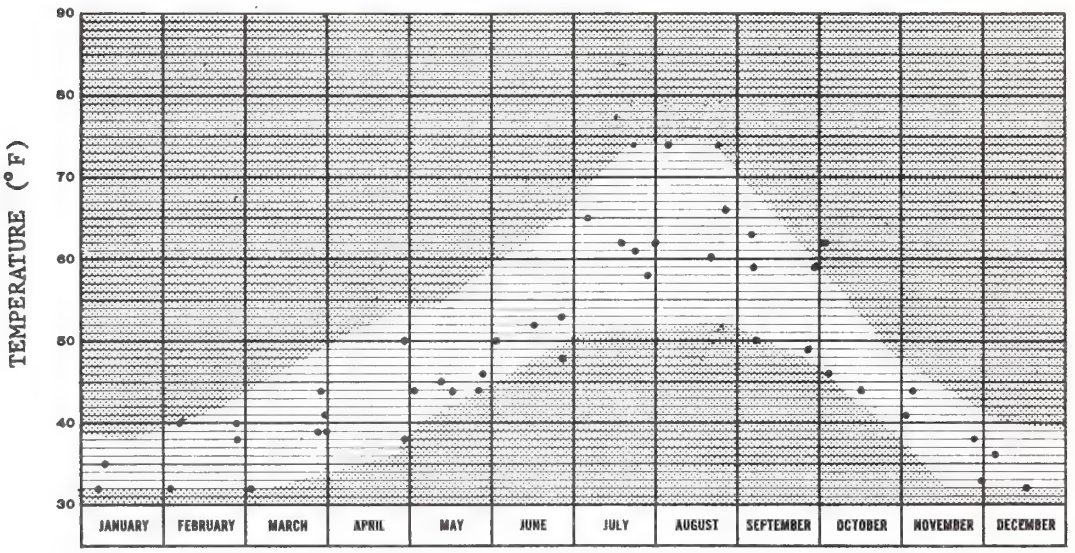
Location.--At gaging station, lat 48°18'40", long 114°08'40", on center of south line of sec.31, T.7 N., R.20 W., on right abutment of old bridge, 20 ft downstream from present highway bridge, 1¼ miles downstream from Blodgett Creek, and 1½ miles west of Corvallis. Altitude of gage is 3,420 ft (from topographic map).

Drainage area.--1,711 sq mi.

Water temperature records available.--43 spot observations made at time of discharge measurements during period July 1959 to September 1963. Thermograph record during period August 1959 to September 1963 published in reports of the Geological Survey.

Extremes.--Discharge 1959-63: Maximum, 12,800 cfs June 4, 1960; minimum, 112 cfs Aug. 27, 1962.

Water temperatures 1959-63: Maximum, 74°F July 22, Aug. 2-4, 19, 21, 24, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1959-63.
The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1959-63.

233. Bitterroot River near Corvallis, Mont. (12-3482)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
11-61	1520	35	2-60	1430	32	2-60	0900	32	28-61	1400	50	13-60	1700	45	1-60	1740	50
8-63	1000	32	7-61	1530	40	30-60	1400	39	28-62	0930	38	15-60	1020	44	14-61	1030	52
			26-61	1500	38	29-61	1300	44				26-62	1000	44	25-62	1100	53
			26-63	1430	40	26-62	0930	39				1-63	1030	44	24-63	1000	48
						29-63	1100	41				28-63	0930	46			
July			August			September			October			November			December		
31-59	1500	62	19-59	1200	60	6-60	1530	63	3-59	0900	46	3-60	1200	44	3-59	1700	36
5-60	1620	65	25-61	1230	66	29-60	1705	59	15-62	1330	44	29-60	1500	33	16-61	1630	32
14-61	0730	62				27-61	1300	49	1-63	1600	62	1-61	1200	41			
28-62	0900	58				8-62	0930	50				27-62	1030	38			
21-63	0830	61				6-63	0830	59									

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1959	Max	--	--	--	--	--	--	--	70	65	53	39	38
	Min	--	--	--	--	--	--	--	56	47	40	32	32
1960	Max	34	38	46	50	52	61	73	72	66	58	47	37
	Min	32	32	32	36	41	45	54	52	50	41	33	32
1961	Max	38	42	47	54	54	65	74	74	66	56	43	38
	Min	32	32	32	37	40	46	56	60	47	38	33	32
1962	Max	36	40	47	49	51	58	69	70	65	55	44	40
	Min	32	32	32	37	41	46	50	54	48	41	33	32
1963	Max	37	42	48	52	53	58	71	73	68	--	--	--
	Min	32	32	34	36	40	45	50	57	52	--	--	--

Extremes for years, 1959-63

Max	38	42	48	54	54	65	74	74	68	58	47	40
Min	32	32	32	36	40	45	50	52	47	38	32	32

234. Willow Creek near Corvallis, Mont. (12-3485)

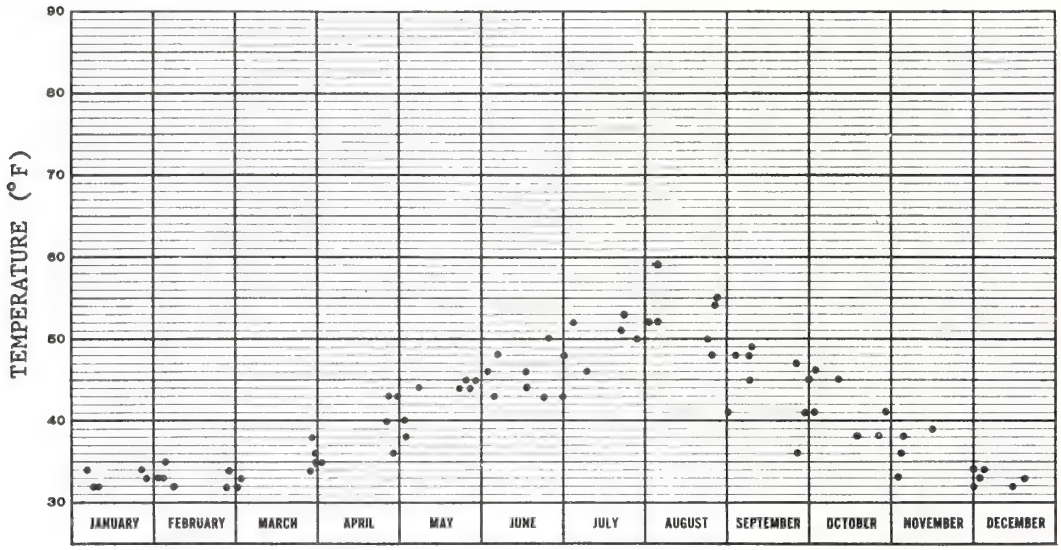
Location.--At gaging station, lat 46°17'40", long 113°59'40", in SW¼NE¼ sec.8, T.6 N., R.19 W., on right bank 800 ft downstream from Butterfly ranger station, half a mile downstream from Horn ditch, and 6 miles southeast of Corvallis. Altitude of gage is 4,130 ft (from topographic map).

Drainage area.--22.4 sq mi.

Water temperature records available.--82 spot observations made at time of discharge measurements during period September 1957 to December 1965.

Extremes.--Discharge 1920-24, 1957-65: Maximum, 168 cfs June 12, 1965; minimum daily, 1 cfs Jan. 4, 1961.

Water temperatures 1957-65: Maximum observed, 59°F Aug. 5, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1957-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
28-60	1445	33	1-59	1700	33	3-59	1130	33	26-61	1630	40	8-58	1720	44	6-59	1530	43
12-61	1325	32	8-61	1125	32	1-60	1615	32	28-62	1630	36	2-59	1700	40	7-60	1600	48
8-63	1200	32	28-62	1405	32	30-60	1240	35	1-64	1500	35	29-61	1830	45	16-61	1030	46
27-64	0900	33	3-63	1530	33	1-61	0930	33	29-64	1230	43	27-62	1830	44	25-62	1800	50
5-65	1615	34	26-63	1700	34	29-61	1500	38	27-65	--	43	2-63	1130	38	24-63	1230	43
			25-64	1430	32	27-62	1730	34				28-63	1300	44	17-64	1600	44
			4-65	1615	35	30-63	1700	36				21-64	1330	44	30-64	1830	48
						2-65	1300	32				26-65	1415	45	3-65	1630	46
						30-65	1530	34							30-65	0950	43
July			August			September			October			November			December		
10-59	1030	46	6-58	1500	52	25-57	1600	47	29-57	1600	41	3-60	1550	36	3-59	1430	34
6-60	1705	52	3-59	1400	52	11-58	1000	48	13-58	1130	45	30-60	1635	32	19-61	1000	33
28-62	1730	50	25-61	1500	54	6-59	0900	48	3-59	1130	41	3-61	1100	33	14-63	0930	32
20-63	1400	51	27-63	1130	48	12-60	1850	49	17-62	1130	38	30-62	0900	34	3-64	1210	33
22-64	1600	53	25-64	1430	50	28-60	1700	46	2-63	1400	46	14-63	1100	39			
			27-64	0800	45	27-61	0930	36	26-65	1600	38	4-64	1640	38			
			5-65	1320	59	11-62	1130	45				30-65	1515	32			
			31-65	0745	41	30-64	1130	45									
						29-65	1545	41									

235. Bear Creek near Victor, Mont. (12-3500)

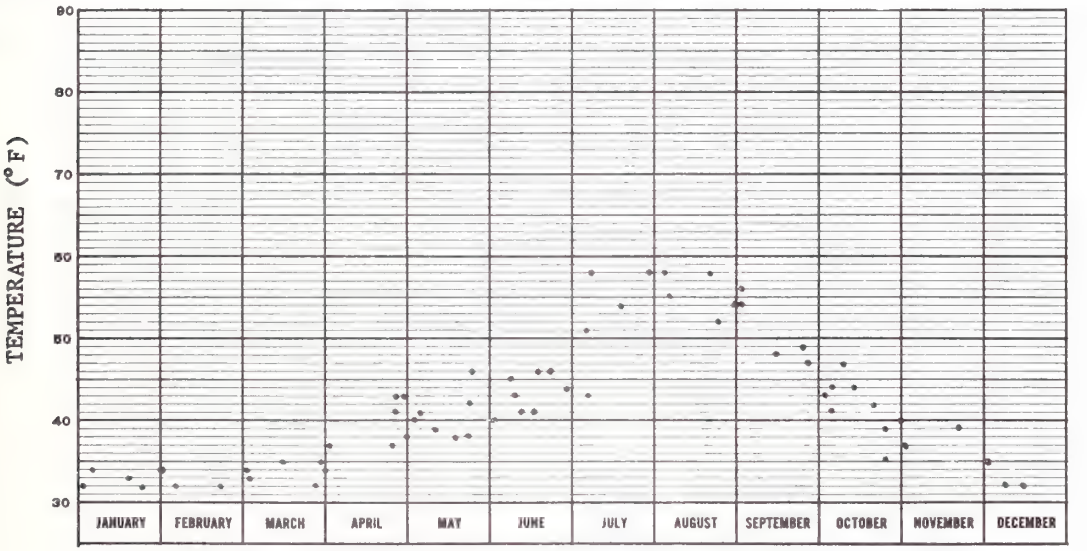
Location.--At gaging station, lat 46°23', long 114°13', in NW¼ sec.9, T.7 N., R.21 W., on left bank 4 miles upstream from mouth and 5 miles southwest of Victor. Altitude of gage is 3,770 ft (from topographic map).

Drainage area.--26.8 sq mi.

Water temperature records available.--67 spot observations made at time of discharge measurements during periods March 1949 to December 1954, September 1957 to September 1959.

Extremes.--Discharge 1938-54, 1957-59: Maximum, 1,340 cfs June 16, 1950; minimum, 0.6 cfs Dec. 1, 1952.

Water temperatures 1949-54, 1957-59: Maximum observed, 58°F Aug. 23, 1949, July 10, 1952, July 30, 1953, Aug. 4, 1959; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-54, 1957-59

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
25-50	1630	32	24-53	1630	32	3-49	1400	33	26-50	1100	37	5-49	1700	41	29-49	1730	44
20-53	1530	33	5-54	1350	32	31-49	1530	34	27-51	1800	41	26-49	1730	46	20-50	1350	46
6-54	1200	34	1-59	0930	34	2-50	1530	34	30-53	1245	38	24-50	0925	38	26-50	1705	46
2-58	1200	32				28-50	1100	32	27-54	1500	43	10-51	1000	39	14-51	0915	41
						30-51	1400	35	2-59	1530	37	3-52	1300	40	9-52	1230	45
						18-53	1740	35	29-59	1430	43	21-53	1215	38	2-53	1645	40
						28-54	1400	32				25-54	1550	42	17-53	0900	41
						3-59	1600	33							11-59	0900	43
July			August			September			October			November			December		
10-52	1600	58	23-49	1330	58	16-52	1045	48	5-49	1730	44	2-49	1600	37	11-52	1100	32
30-53	1300	58	31-50	0925	54	2-53	1540	54	5-50	0950	41	23-54	1200	39	2-53	1000	35
21-54	1600	54	7-52	0930	55	27-54	1100	47	9-51	1730	47				16-54	1230	32
8-58	1000	51	25-54	1230	52	26-57	0930	49	23-52	1300	42						
8-59	1230	43	6-58	1000	55	2-59	1500	56	3-53	1300	43						
			4-59	1330	58				27-53	1130	39						
									27-54	1200	35						
									31-57	1000	40						
									13-58	1530	44						
									5-59	1030	41						

236. Kootenai Creek near Stevensville, Mont. (12-3505)

Location.--At gaging station, lat 46°32'30", long 114°10'00", in SW¼NW¼ sec.18, T.9 N., R.20 W., on left bank 3 miles upstream from mouth and 4 miles northwest of Stevensville. Altitude of gage is 3,780 ft (from topographic map).

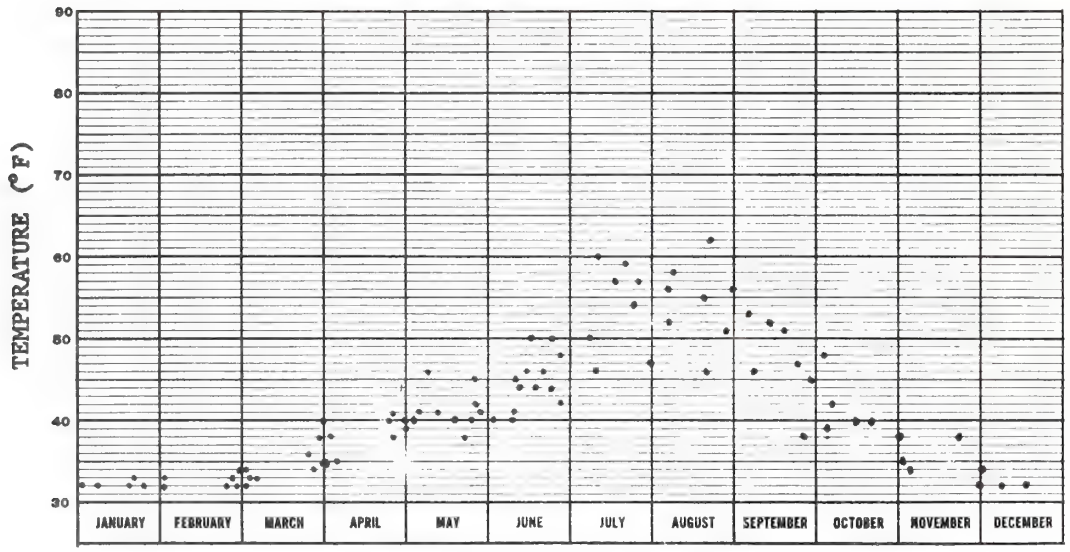
Drainage area.--28.9 sq mi.

Water temperature records available.--93 spot observations made at time of discharge measurements during periods March 1949 to September 1953, September 1957 to September 1963, June 1964.

Extremes.--Discharge 1948-53, 1957-65: Maximum, 1,300 cfs June 17, 1950.

Discharge 1948-53, 1957-63: Minimum daily, 2.0 cfs Nov. 30, 1952.

Water temperatures 1949-53, 1957-64: Maximum observed, 62°F Aug. 24, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1957-64

236. Kootenai Creek near Stevensville, Mont. (12-3505)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
25-50	1130	32	24-53	1410	32	3-49	1000	33	5-49	0830	35	6-49	1130	41	27-49	1430	48
20-53	1215	33	2-59	1300	33	2-50	1130	34	26-50	1400	40	27-49	1100	42	20-50	1100	46
2-58	1030	32	28-61	1450	34	28-50	1400	34	27-51	1200	38	24-50	1430	38	26-50	0930	42
7-60	1000	32	27-62	1430	32	31-51	1800	40	3-52	1700	38	3-52	1600	40	14-51	1415	46
19-61	1220	32	2-63	1630	32	31-53	1100	35	30-53	1630	39	19-53	1610	40	10-52	1700	45
7-63	1500	32	26-63	1100	33	5-59	0930	33	27-59	1430	41	10-58	1100	46	2-53	1335	40
						2-60	1530	32	1-60	0910	35	5-60	1330	41	17-53	1255	44
						30-61	1100	38	29-61	0930	40	14-60	1615	41	11-59	1800	44
						26-62	1500	36	27-62	1600	38	29-61	0930	41	8-60	1800	40
						29-63	1500	38	30-63	1100	40	26-62	1500	40	16-61	1300	50
												27-63	1600	45	24-62	1500	50
															23-63	1600	44
															9-64	1130	41
July			August			September			October			November			December		
26-49	1530	54	23-49	1100	55	19-52	1115	51	6-49	1300	42	2-49	1330	35	8-52	1620	32
28-53	1500	57	29-50	1530	51	26-57	1200	47	20-52	1445	40	4-60	1140	34	1-59	1205	34
9-58	1200	50	7-52	1600	58	13-58	1130	52	4-53	0950	39	30-60	1400	32	16-61	1100	32
11-59	0900	46	31-53	1520	56	29-60	1025	45	5-59	1430	42	1-61	1600	38			
19-60	1135	57	5-58	1300	56	27-61	1700	38	14-62	1600	40	26-62	1600	38			
13-61	1600	60	5-59	0930	52	8-62	1400	46	3-63	1030	48						
31-62	0930	47	23-60	1200	46	6-63	1030	53									
22-63	1630	59	24-61	1430	62												

237. Burnt Fork Creek near Stevensville, Mont. (12-3510)

Location.--At gaging station, lat 46°27'50", long 113°56'40", in NW¼SW¼ sec.11, T.8 N., R.19 W., on right bank 150 ft upstream from county road bridge and 8 miles southeast of Stevensville. Altitude of gage is 4,270 ft (from topographic map).

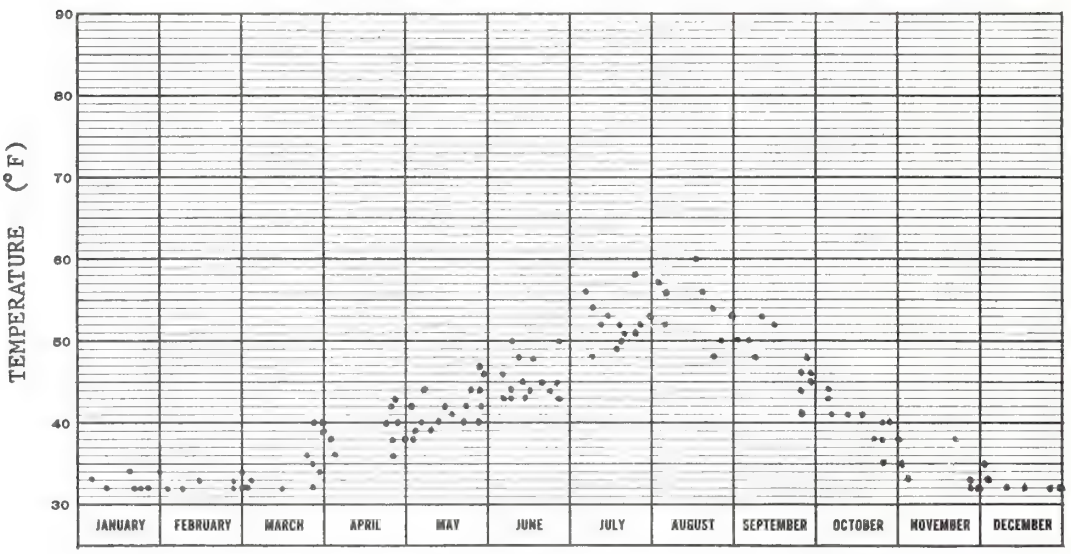
Drainage area.--74.0 sq mi.

Water temperature records available.--135 spot observations made at time of discharge measurements during period March 1949 to October 1962.

Extremes.--Discharge 1920, 1922-24, 1938-65: Maximum, 720 cfs June 8, 1964.

Discharge 1920, 1922-24, 1938-62: Minimum daily, 2 cfs Mar. 11, 1948.

Water temperatures 1949-62: Maximum observed, 60°F Aug. 20, 1957; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-62

237. Burnt Fork Creek near Stevensville, Mont. (12-3510)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
24-50	1730	32	26-53	1510	33	3-49	1130	33	4-49	1900	36	6-49	1300	40	27-49	1030	43
22-53	1530	34	3-54	1700	32	2-50	1800	32	26-50	1630	42	27-49	1330	44	26-50	1350	45
6-54	1030	33	26-55	1000	32	28-50	1600	35	27-51	1430	38	16-51	1100	43	14-51	1125	45
26-55	1130	32	14-57	1330	33	31-51	1600	39	3-52	1400	38	3-52	1800	42	10-52	1500	50
5-56	1100	33	1-59	1530	34	31-53	1350	39	30-53	1745	38	19-53	1940	41	8-53	1655	43
28-56	1400	32	8-61	1240	32	28-54	1200	32	27-54	1200	42	25-54	1910	42	15-53	1710	44
12-61	1505	32	28-61	1630	34	16-55	1230	32	27-55	1030	36	24-55	1430	40	6-55	1930	46
			28-62	1630	32	30-55	1100	34	28-56	1130	40	8-57	1215	44	14-55	0830	43
						28-56	1130	35	28-57	1200	43	29-57	0900	42	6-56	1300	43
						27-57	1100	36	26-61	1300	40	12-58	1100	39	21-56	1100	45
						4-59	1500	33	28-62	1300	40	4-59	1030	39	18-57	1900	48
						2-60	1340	32				14-60	1130	40	13-58	1630	48
						30-60	0850	34				29-61	1500	47	6-59	1300	43
						29-61	1630	40				30-61	1400	46	8-60	1400	44
						26-62	1800	36				28-62	1130	40	14-61	1700	48
						31-63	0940	40				3-63	1305	38	27-62	1430	50
												29-63	1255	44	23-63	1235	44
July			August			September			October			November			December		
26-49	1830	51	22-49	1600	56	18-52	1745	52	6-49	1600	41	2-49	1030	35	11-52	1335	32
16-51	1545	53	31-50	1250	53	2-53	1715	50	5-50	1155	43	23-54	1000	38	2-53	1200	35
10-52	1300	54	7-52	1130	52	29-53	1730	45	20-52	1705	41	28-55	1700	33	16-54	1000	32
31-53	1130	53	25-54	1000	48	27-54	0850	44	27-53	1400	40	28-56	1530	32	29-56	0930	32
21-54	1230	50	24-55	0930	48	27-55	0830	41	27-54	1000	35	4-60	0935	33	31-57	1730	32
19-55	1030	49	27-56	1330	50	27-56	1600	46	27-55	0800	38	30-60	1440	32	3-59	1150	33
24-56	1730	58	20-57	1600	60	17-57	1700	52	25-56	1100	38	1-61	1800	38	16-61	1400	32
23-57	1630	58	5-58	1100	56	5-59	1200	50	29-57	1430	40						
10-59	1430	48	3-59	1730	57	12-60	1655	53	5-59	1600	44						
7-60	1720	56	25-61	0800	54	29-60	1230	46	15-62	1530	41						
14-61	0930	52				28-61	0900	48									
28-62	1130	52				8-62	1630	48									
20-63	1200	52															

238. Bitterroot River near Florence, Mont. (12-3512)

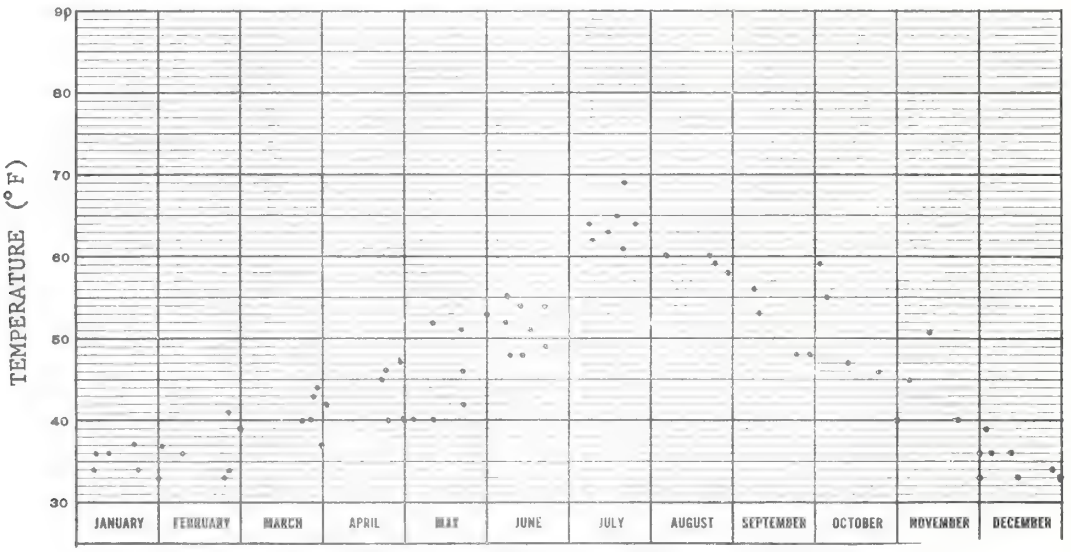
Location.--At gaging station, lat 46°38'00", long 114°03'00", on south line of SE¼ sec.12, T.10 N., R.20 W., on downstream side of bridge on State Secondary Highway 269, 1.3 miles east of Florence, and at mile 24.6. Altitude of gage is 3,200 ft (from topographic map).

Drainage area.--2,354 sq mi.

Water temperature records available.--70 spot observations made at time of discharge measurements during period May 1958 to December 1965.

Extremes.--Discharge 1957-65: Maximum, 20,300 cfs June 9, 1964; minimum observed, 365 cfs Aug. 20, 1961.

Water temperatures 1958-65: Maximum observed, 69°F July 21, 1964; minimum observed, 33°F at times, but probably at freezing point on many days during winter months.



Spot observations of water temperatures, 1958-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
26-59	1500	34	26-59	1600	34	28-60	1535	43	26-61	1000	40	12-58	1600	40	13-58	1100	48
12-61	1640	36	9-61	1000	36	1-61	1250	39	26-62	1800	46	3-59	1100	40	1-60	1650	53
6-63	1700	34	25-62	1400	33	30-61	1330	44	30-63	1600	40	12-60	1635	52	8-60	1835	52
25-64	1030	37	1-63	1830	33	25-62	1500	40	2-64	1430	42	25-62	1830	46	13-61	1300	54
7-65	1610	36	25-63	1630	34	27-63	1730	40	25-64	1330	45	25-63	1500	42	24-62	1000	54
			2-65	1550	37	31-65	1320	37	29-65	1420	47	25-64	1430	51	23-63	1000	49
			26-65	1115	41										10-64	0950	48
															16-64	1530	51
															10-65	1630	55
July			August			September			October			November			December		
7-60	1250	64	24-61	0800	60	8-60	1050	53	4-60	1455	55	4-60	1600	45	31-57	1330	33
18-60	1700	65	25-64	1030	59	26-61	1830	48	31-61	1500	40	26-62	1030	40	29-58	1330	34
13-61	0900	63	6-65	0925	60	7-62	1400	56	14-62	0930	47	14-63	1330	51	4-59	1100	36
27-62	1430	64	30-65	1515	58	29-65	1200	48	2-63	1700	59				1-60	1130	33
20-63	0800	61							27-65	1415	46				15-61	1230	33
21-64	1400	69													12-63	1000	36
8-65	1445	62													3-64	1020	39
															1-65	1400	36

239. Eightmile Creek near Florence, Mont. (12-3514)

Location.-- At gaging station, lat 46°39'10", long 113°57'30", in SW¼SW¼ sec.2, T.10 N., R.19 W., on right bank 0.6 mile upstream from Granite Creek, 5 miles upstream from mouth, and 6 miles east of Florence. Altitude of gage is 3,800 ft (from topographic map).

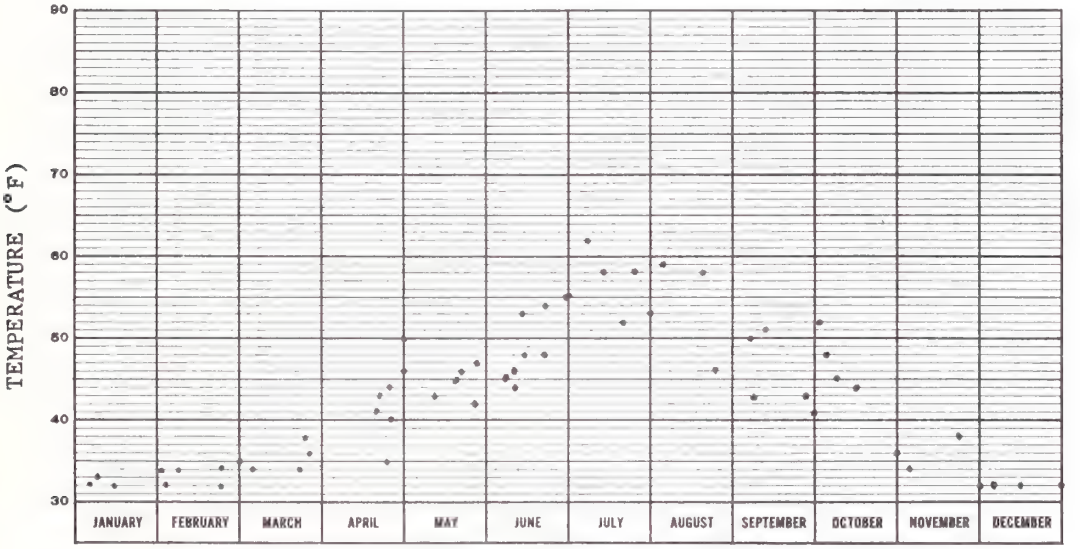
Drainage area.--20.6 sq mi.

Water temperature records available.--59 spot observations made at time of discharge measurements during periods May 1958 to October 1963, May, June 1964, April 1965.

Extremes.--Discharge 1957-65: Maximum, 104 cfs June 8, 1964.

Discharge 1957-63: Minimum daily, 1.0 cfs Jan. 11, 12, 1963.

Water temperatures 1958-65: Maximum observed, 62°F July 7, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1958-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
5-60	1300	32	2-59	1730	34	5-59	1500	34	27-59	1300	44	1-58	1400	50	13-58	1200	48
13-61	1155	32	3-60	1025	32	28-60	1320	36	26-61	0900	35	14-60	1300	43	6-59	1000	45
7-63	1730	33	8-61	1425	34	1-61	1130	35	27-62	1900	40	29-61	1200	47	9-60	1230	44
			25-62	1800	32	27-61	1400	36	30-63	1400	46	28-62	0800	42	13-61	1530	53
			3-63	1100	32	25-62	1530	34	21-65	1815	41	25-63	1130	46	23-62	1800	54
			25-63	1800	34	27-63	1600	38	22-65	1730	43	20-64	1130	45	22-63	1900	48
															10-64	1130	46
															30-64	1530	55
July			August			September			October			November			December		
7-60	1535	62	4-58	1515	59	30-58	0930	41	7-59	1000	45	4-60	1440	34	31-57	1630	32
13-61	1200	58	1-59	0800	53	11-59	1130	51	4-60	1350	48	26-62	1300	38	4-59	1030	32
27-62	1630	58	24-61	1030	58	8-60	0935	43	31-61	1700	36				1-60	1025	32
20-63	1000	52	27-63	0730	46	28-61	1200	43	14-62	1200	44				15-61	1600	32
						7-62	1630	50	2-63	1530	52						

240. Lolo Creek above Sleeman Creek, near Lolo, Mont. (12-3520)

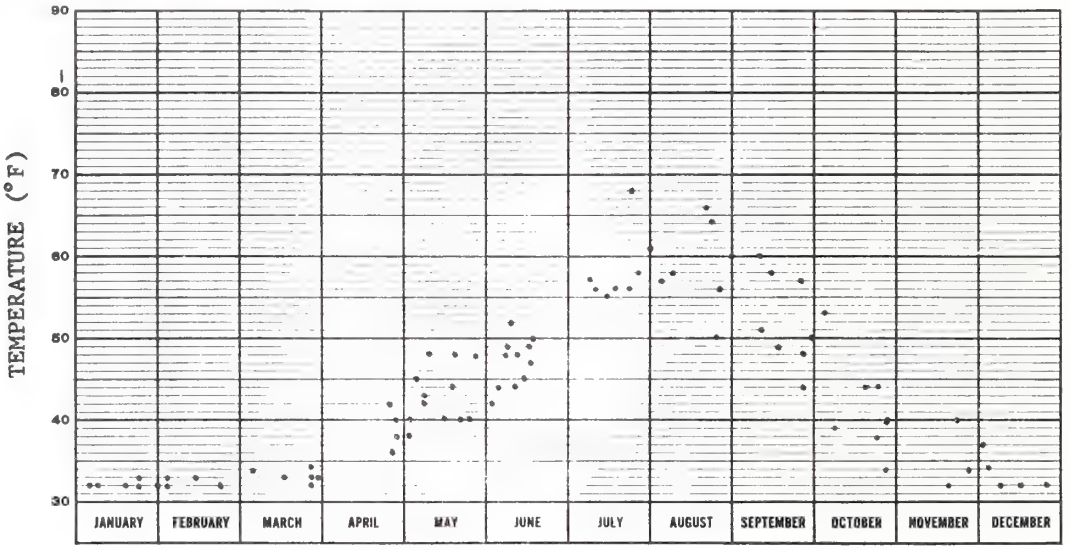
Location.--At gaging station, lat 46°45', long 114°09', in NW¼ sec.5, T.11 N., R.20 W., on left bank 2 miles upstream from Sleeman Creek, 3 miles west of Lolo, and 4 miles upstream from mouth. Altitude of gage is 3,290 ft (from topographic map).

Drainage area.--250 sq mi.

Water temperature records available.--85 spot observations made at time of discharge measurements during period May 1951 to October 1960.

Extremes.--Discharge 1950-60: Maximum, 2,430 cfs May 24, 1956; minimum, 6.3 cfs Nov. 9, 1952.

Water temperatures 1951-60: Maximum observed, 68°F July 24, 1956; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1951-60

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
20-53	0950	32	24-53	1630	32	18-53	1100	33	28-53	1405	38	2-51	1100	38	11-51	1645	52
6-54	0900	32	3-54	1430	32	28-54	1000	32	27-54	1000	42	8-51	1355	43	10-52	1630	49
26-55	1000	32	24-55	1630	32	30-55	0900	33	27-55	0900	36	16-51	0730	40	2-53	1030	42
5-56	0900	32	1-57	0930	32	28-56	0930	33	28-56	0900	40	19-53	1330	44	19-53	1305	47
4-58	1130	32	14-57	1600	33	27-57	0900	34				26-54	0950	40	15-55	1005	45
26-59	1300	33	3-59	1100	33	6-59	1030	34				24-55	1200	40	5-56	0800	44
						28-60	1145	34				20-56	1530	48	20-56	0800	50
												8-57	1010	42	19-57	0930	49
												29-57	1130	48	13-58	1400	48
												10-58	1300	48	12-59	0930	44
												3-59	1300	40	9-60	1000	48
												5-60	1615	45			
July			August			September			October			November			December		
11-52	1030	56	8-52	1615	58	15-52	1030	58	20-52	1230	44	19-51	1400	32	8-52	1330	32
28-53	1130	58	31-53	1335	60	29-53	1545	50	27-53	0930	40	23-54	0830	40	2-53	1330	37
21-54	0930	56	25-54	1855	50	27-54	1930	48	27-54	0830	34	28-55	1530	34	16-54	0830	32
19-55	0800	55	22-55	1730	64	27-55	1900	44	26-55	0830	44	27-56	1430	34	28-56	0830	32
24-56	1930	68	27-56	1530	56	27-56	1730	57	24-56	0800	38				4-59	1340	34
24-57	1000	56	20-57	1800	66	18-57	0900	49	8-59	0900	39						
9-59	1330	57	4-58	1630	57	12-59	0900	51	4-60	1620	53						
			1-59	1200	61	12-60	1515	60									

241. Clark Fork below Missoula, Mont. (12-3530)

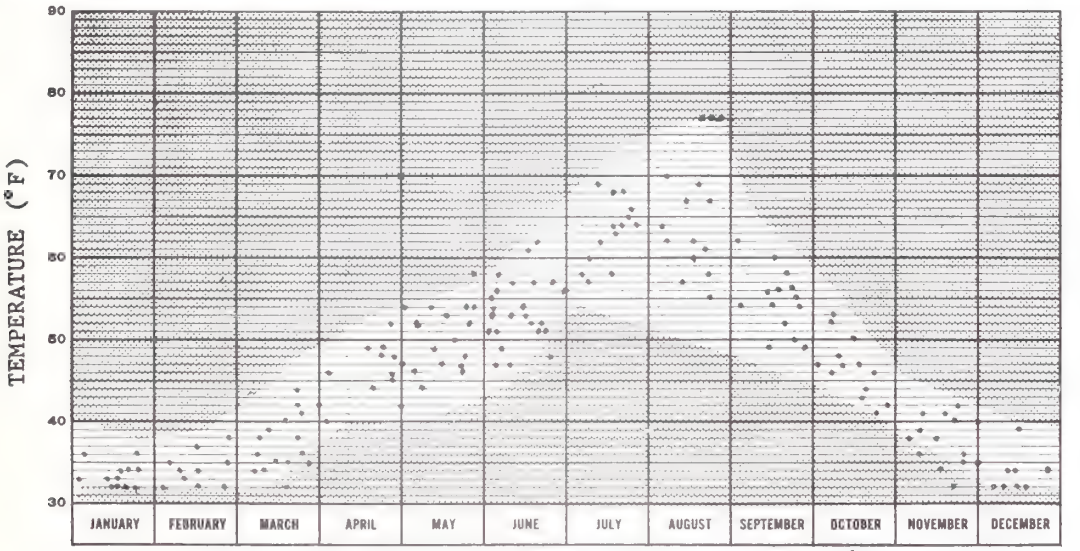
Location.--At gaging station, lat 46°52'10", long 114°07'30", in NE¼SE¼ sec.21, T.13 N., R.20 W., on right bank 1.0 mile downstream from Bitterroot River, 5 miles west of Missoula, and at mile 349.5. Altitude of gage is 3,090 ft (from topographic map).

Drainage area.--9,003 sq mi.

Water temperature records available.--185 spot observations made at time of discharge measurements during period March 1949 to December 1965. Thermograph record during period October 1959 to September 1964 (incomplete) published in reports of the Geological Survey.

Extremes.--Discharge 1929-65: Maximum, 52,800 cfs May 23, 1948; minimum, 388 cfs Jan. 18, 1933.

Water temperatures 1949-65: Maximum, 77°F Aug. 19, 22, 24, 1961; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1959-64.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
20-50	1300	32	27-53	1700	38	18-49	1130	35	22-49	1300	44	9-49	1400	52	25-50	1300	43
24-53	1130	36	3-54	0935	32	8-50	1200	34	2-50	1200	42	23-49	1300	48	10-52	1000	57
5-54	1600	36	24-55	1400	32	26-51	1800	42	30-51	1200	42	5-50	1800	46	4-53	1455	47
24-55	1600	34	26-58	1500	35	31-52	1600	42	3-53	1040	40	22-50	0915	40	8-53	0905	47
3-56	1600	33	11-59	1630	34	27-54	1100	41	27-53	1420	52	16-51	1020	47	20-53	0855	52
27-56	1000	32	7-61	1015	35	29-55	1000	35	26-54	1000	49	1-52	0945	47	6-55	0930	49
23-58	1400	32	19-62	1600	32	27-56	1000	36	25-55	1700	48	27-53	1700	52	15-55	1245	53
14-59	1630	33	12-63	1300	33	26-57	1030	38	27-56	1000	45	7-57	1835	52	4-56	1500	54
19-60	1630	32	19-64	1630	37	26-58	1400	44	28-58	1400	48	12-58	1430	49	19-56	1100	57
17-61	1030	33	19-65	1500	34	11-59	1630	38	27-59	1600	46	21-58	1030	54	17-57	0930	52
17-62	1600	32				9-60	1430	34	13-60	1400	43	27-58	1530	58	6-58	1100	58
15-63	1200	32				10-61	0920	36	4-61	1540	46	20-59	1530	46	17-58	1300	61
20-64	1400	34				12-62	1400	34	19-62	1600	49	11-60	1030	54	30-58	0830	56
18-65	1530	34				14-63	1330	39	9-63	1430	47	2-61	1600	54	5-59	0830	51
						21-64	1200	40	20-64	1000	44	24-61	0840	52	3-60	1200	55

241. Clark Fork below Missoula, Mont. (12-3530)
Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						22-65	1510	32	19-65	1225	44	26-61	1425	54	21-60	0715	51
												14-62	1630	47	5-61	1600	56
												15-63	1600	53	14-61	1130	54
												27-63	1400	54	4-62	1030	47
												8-64	1130	44	26-62	0930	57
												18-64	1730	50	19-63	1430	62
												20-65	1545	47	2-64	1700	51
															19-64	1800	51
															3-65	1400	53
															10-65	1020	53
July			August			September			October			November			December		
13-49	1800	69	9-49	1800	70	18-51	1500	60	7-49	1200	46	11-52	1630	39	7-49	1100	32
7-53	1100	58	26-49	1530	67	3-53	1430	62	24-51	1330	44	30-53	1200	40	12-52	1725	34
20-54	1030	64	27-52	1000	55	28-53	1345	54	7-52	1830	52	22-54	1030	41	14-54	1700	34
18-55	1130	64	24-54	1300	61	26-54	1300	56	26-53	1400	46	27-55	1500	35	27-56	1000	34
23-56	1100	65	22-55	1430	69	26-55	1230	50	26-54	1100	41	27-56	0930	36	19-57	1300	32
22-57	1400	68	27-56	1100	58	25-56	1430	58	25-55	1200	46	25-57	1330	40	10-58	1630	32
24-58	1200	66	19-57	0930	60	16-57	1130	56	23-56	1130	43	24-59	1100	32	15-59	1630	34
9-59	0900	57	20-58	1000	60	4-59	1500	54	2-58	0930	47	10-60	1000	36	7-60	1350	32
20-60	1015	68	6-59	1400	64	28-59	1710	49	29-59	1000	42	7-61	1530	38	17-62	1730	39
13-61	1000	62	17-60	1115	57	23-60	1030	52	11-60	1045	47	30-61	1700	35	18-64	1600	32
26-62	1130	64	8-61	1230	62	27-62	1730	55	10-61	1600	48	17-62	1330	38	15-65	1455	32
17-63	1700	58	28-62	1300	55	19-63	1500	56	25-62	1800	46	26-63	1700	42			
9-64	1100	60	20-63	1600	62	17-64	1830	54	21-63	1430	50	18-64	1455	34			
19-65	1430	63	18-65	1445	67	15-65	1625	49	22-64	1515	47	12-65	0945	41			
									8-65	1245	53						

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1959	Max	--	--	--	--	--	--	--	--	--	50	42	--
	Min	--	--	--	--	--	--	--	--	--	41	--	--
1960	Max	--	--	41	50	56	64	75	70	65	57	43	35
	Min	--	32	33	40	45	50	60	53	51	40	33	32
1961	Max	38	39	44	52	56	66	71	77	61	54	41	41
	Min	32	32	35	42	45	51	57	52	45	39	35	32
1962	Max	37	--	43	49	51	60	68	67	62	54	46	41
	Min	32	32	32	40	45	46	55	53	50	44	35	35
1963	Max	--	--	48	54	57	63	66	70	66	59	45	--
	Min	32	--	37	43	46	51	54	56	53	43	40	--
1964	Max	36	38	46	49	52	58	66	66	56	--	--	--
	Min	34	34	34	40	40	45	55	49	48	--	--	--
Extremes for years 1959-64													
	Max	38	39	48	54	57	66	75	77	66	59	46	41
	Min	32	32	32	40	40	45	54	49	45	39	33	32

242. Clark Fork near Frenchtown, Mont.

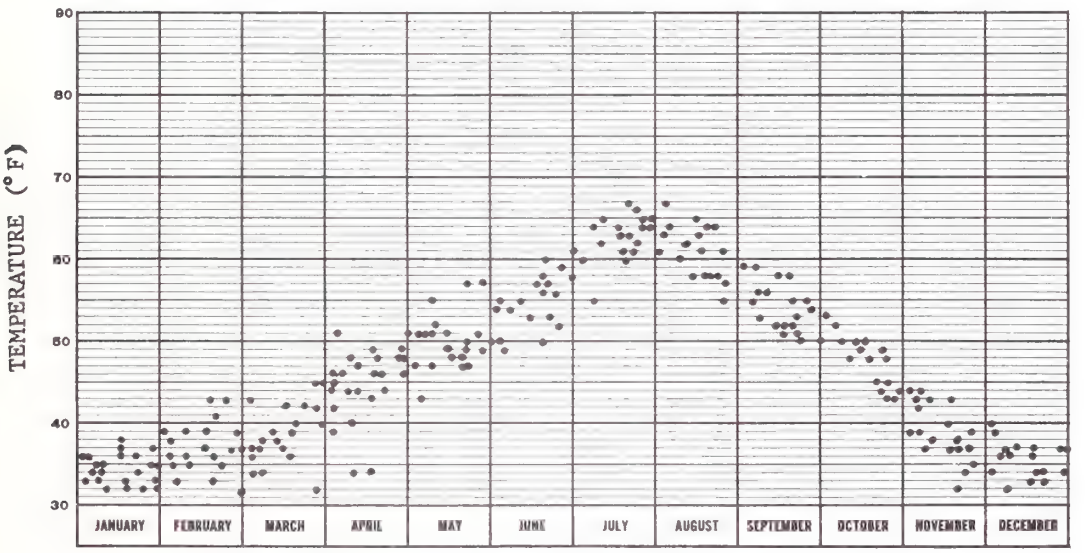
Location.--Lat 46°57'35", long 114°13'05", near center of sec.23, T.14 N., R.21 W., on right bank at Hoerner-Waldorf Mill Division plant, 2 miles downstream from Deep Creek, and 4 miles south of Frenchtown. Altitude is 3,030 ft (from topographic map).

Water temperature records available.--252 spot observations made mostly at weekly intervals during period December 1957 to December 1965.

Extremes.--Water temperatures 1957-65: Maximum observed, 67°F July 20, 1960, Aug. 4, 1961; minimum, freezing point on many days during winter months.

Remarks.--All readings made between 0800 and 1130 hours.

Cooperation.--Records furnished by Hoerner-Waldorf Corporation, Missoula, Mont.



Spot observations of water temperatures, 1957-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
7-58	--	34	1-58	--	39	3-58	--	37	2-58	--	46	7-58	--	51	4-58	--	55
10-58	--	35	6-58	--	38	7-58	--	38	4-58	--	46	21-58	--	57	11-58	--	55
15-58	--	38	11-58	--	39	12-58	--	38	9-58	--	48	28-58	--	57	18-58	--	58
17-58	--	37	14-58	--	39	14-58	--	36	11-58	--	47	13-59	0945	51	3-59	0925	55
21-58	--	36	18-58	--	41	19-58	--	40	16-58	--	49	20-59	0905	47	17-59	1055	56
28-58	--	37	22-58	--	43	21-58	--	42	18-58	--	46	27-59	0945	49	1-60	0855	54
8-59	0900	35	27-58	--	39	27-58	--	45	30-58	--	51	4-60	0905	51	8-60	1010	54
14-59	0910	36	6-59	0800	35	29-58	--	45	1-59	0910	44	11-60	0915	55	22-60	1015	53
21-59	0900	34	11-59	1215	35	6-59	0900	37	8-59	0930	44	18-60	0855	47	30-60	0845	61
30-59	1215	35	25-59	0840	37	11-59	0920	39	15-59	0900	46	5-61	1100	43	30-61	0910	58
5-60	0915	36	3-60	0915	36	25-59	0925	42	29-59	0915	48	2-62	1035	47	6-62	0930	49
27-60	0940	35	10-60	0940	36	9-60	0850	37	6-60	1015	51	9-62	1030	51	13-62	1055	53
3-62	0955	33	18-61	0310	43	16-60	0910	37	20-60	1010	46	16-62	1005	48	21-62	0950	57
10-62	0950	32	22-61	1045	43	4-61	1025	43	6-61	1050	41	23-62	1110	50	27-62	1000	59
17-62	0910	32	7-62	0940	33	7-62	1010	34	21-61	1040	44	31-62	0955	50	14-63	--	57

242. Clark Fork near Frenchtown, Mont.

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
22-62	0940	32	14-62	1005	37	14-62	1045	42	27-61	1020	48	8-63	--	47	19-63	--	60
31-62	1020	32	21-62	1010	35	28-62	1055	40	4-62	1045	45	13-64	--	49	26-63	--	52
2-63	--	36	28-62	1020	32	4-64	--	34	11-62	1040	44	20-64	--	49	3-64	--	50
9-63	--	34	28-63	--	37	18-64	--	39	18-62	1030	48	12-65	--	52	17-64	--	50
8-64	--	33	19-64	--	33	25-64	--	32	25-62	1000	48	19-65	--	48	23-65	--	56
15-64	--	33	17-65	--	36	3-65	--	36	3-63	--	42	27-65	--	51			
29-64	--	33							18-63	--	43						
20-65	--	36							2-64	--	39						
									8-64	--	40						
									11-64	--	34						
									15-64	--	34						
									29-64	--	46						
									7-65	--	44						
									28-65	--	49						
July			August			September			October			November			December		
11-58	--	65	6-58	--	64	17-58	1100	58	3-58	1000	53	5-58	0915	44	29-57	--	37
16-58	--	61	13-58	--	65	11-59	0905	56	15-58	0955	50	19-58	0930	38	3-58	0935	40
23-58	--	66	20-58	1040	64	25-59	0905	55	22-58	1015	44	4-59	0915	39	10-58	0920	36
30-58	--	65	5-59	0910	64	30-59	1025	50	29-58	0925	44	18-59	1025	32	17-58	0910	37
8-59	0935	55	12-59	1335	62	14-60	0950	58	7-59	0955	50	25-59	0905	35	31-58	0920	37
15-59	1005	63	19-59	0935	58	21-60	0945	53	14-59	0910	49	2-60	0955	44	3-59	0955	34
29-59	0910	64	26-59	0905	57	28-60	0950	54	28-59	1030	43	9-60	--	38	9-59	0905	32
6-60	0930	64	3-60	0945	63	7-61	1125	59	5-60	0940	52	23-60	0940	37	17-59	0910	36
14-60	0920	64	17-60	1045	58	13-61	0955	52	12-60	0950	48	2-61	1120	39	23-59	0950	33
20-60	0915	67	4-61	0945	67	21-61	1010	51	26-60	0925	45	8-61	1020	37	30-59	0945	34
27-60	0920	65	16-61	1030	63	5-62	0955	55	11-61	1100	48	15-61	0950	37	6-61	1020	36
19-61	0950	63	1-62	0945	61	19-62	1015	55	18-61	1100	48	22-61	1030	34	21-61	0955	34
27-61	0950	64	8-62	0950	60	18-63	--	52	26-61	1055	43	14-62	0955	40	12-62	1005	37
11-62	1005	62	15-62	0935	61	25-63	---	55	24-62	1030	48	6-63	--	42	18-63	--	34
18-62	1050	60	21-63	--	58	9-64	--	53	2-63	--	53	4-64	--	43	2-64	--	39
3-63	--	60	13-64	--	58	16-64	--	51	23-63	--	49	18-64	--	37	9-64	--	37
10-63	--	62	26-64	--	55	2-65	--	59	14-64	--	50	3-65	--	43	9-65	--	37
24-63	--	62	18-65	--	64	8-65	--	56	13-65	--	50	10-65	--	43	15-65	--	33
21-65	--	61	25-65	--	61	15-65	--	52	20-65	--	45	17-65	--	43	30-65	--	34
						22-65	--	50	27-65	--	43	24-65	--	39			

243. St. Regis River near St. Regis, Mont. (12-3540)

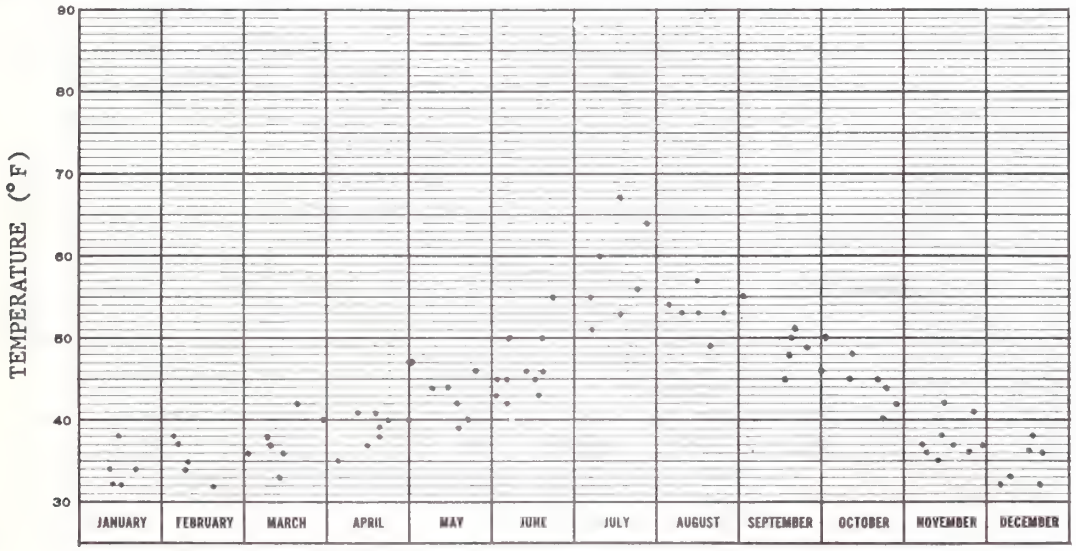
Location.--At gaging station, lat 47°17'50", long 115°07'20", in NE¼ sec.26, T.18 N., R.28 W., on left bank at county road bridge, 500 ft upstream from Little Joe Creek, 1½ miles west of St. Regis, and 1.7 miles upstream from mouth. Datum of gage is 2,645.00 ft above mean sea level, datum of 1929.

Drainage area.--303 sq mi.

Water temperature records available.--89 spot observations made at time of discharge measurements during period October 1958 to December 1965.

Extremes.--Discharge 1910-17, 1954, 1958-65: Maximum, about 11,000 cfs May 19, 1954; minimum daily, 45 cfs Dec. 11, 1962.

Water temperatures 1958-65: Maximum observed, 67°F July 19, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1958-65

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
13-59	1630	34	10-59	1600	34	10-59	1630	38	17-59	1000	37	19-59	1530	42	5-59	1230	42
16-61	0930	38	6-61	1155	37	10-60	1300	37	14-60	1540	41	10-60	1300	44	18-59	1200	45
16-62	1400	32	20-62	1400	32	9-61	1430	38	5-61	1030	35	1-61	1750	47	2-60	1055	45
14-63	1500	32	11-63	1330	35	13-62	1300	33	20-62	1730	41	23-61	0800	40	20-60	1100	46
21-64	1300	34	20-64	0830	32	15-63	1000	36	23-63	1300	40	27-61	1810	46	6-61	1530	50
			4-65	1735	38	21-64	1700	42	21-64	1030	38	15-62	1630	44	15-61	0710	46
						2-65	1755	36	21-65	1900	39	19-64	1100	39	5-62	1530	45
						30-65	1710	40	30-65	1150	40				25-62	1500	55
															20-63	0900	50
															19-64	1000	43
															2-65	1445	43
July			August			September			October			November			December		
8-59	1300	51	5-59	1200	54	2-59	1945	55	2-58	1400	50	13-58	1200	35	9-58	1600	33
19-60	1855	67	16-60	1425	57	30-59	1400	46	28-59	1730	42	25-59	1400	36	16-59	0900	36
12-61	1300	60	9-61	0800	53	22-60	1245	51	12-60	1430	45	9-60	1245	36	6-60	1315	32
25-62	1000	56	27-62	1400	53	27-62	1030	49	11-61	0930	45	8-61	1230	37	17-62	1130	38
19-63	0900	53	21-63	0730	49	20-63	1000	48	25-62	1230	44	30-61	0900	37	20-64	1120	32
8-64	1230	55	16-64	1030	53	18-64	1105	45	22-63	0800	45	16-62	1630	38	21-65	1225	36
29-65	1305	64	26-65	1620	53	21-65	1435	50	23-64	1155	40	27-63	1000	41			
									13-65	1540	48	19-64	1130	37			
												17-65	1535	42			

244. Clark Fork at St. Regis, Mont. (12-3545)

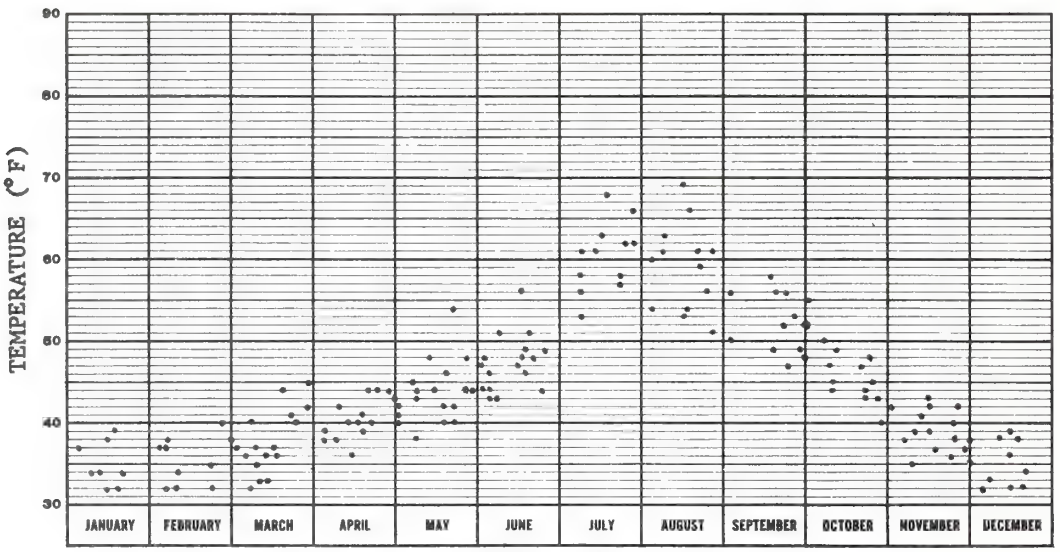
Location.--At gaging station, lat 47°18'05", long 115°05'15", in center of SW¼ sec.19, T.18 N., R.27 W., on left bank at St. Regis, 0.4 mile downstream from St. Regis River, and at mile 270.3. Altitude of gage is 2,600 ft (river-profile map).

Drainage area.--10,709 sq mi.

Water temperature records available.--169 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1910-65: Maximum, 68,900 cfs May 24, 1948; minimum, 1,000 cfs Dec. 17, 1940.

Water temperatures 1949-65: Maximum observed, 69°F Aug. 16, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

244. Clark Fork at St. Regis, Mont. (12-3545)
Water temperatures at time of discharge measurements

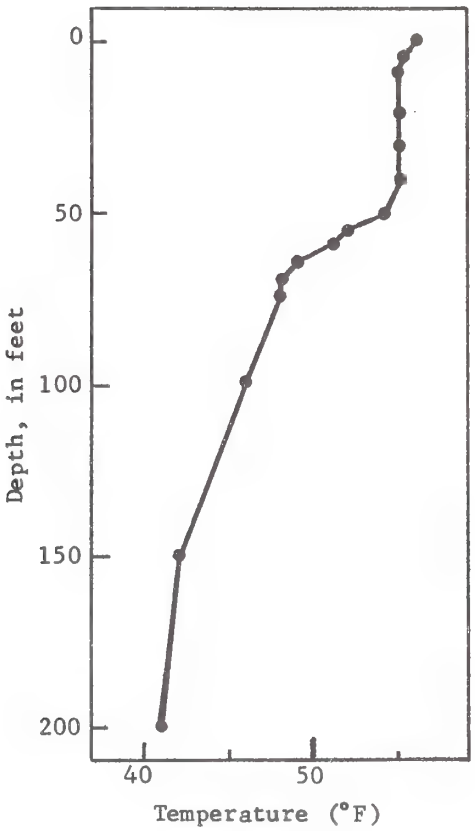
Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
19-53	1700	39	28-53	1150	38	16-49	1530	36	20-49	1330	40	20-49	1230	46	24-50	1215	44
4-54	1630	37	8-54	1430	38	6-50	1400	36	5-50	1330	39	2-50	1430	40	10-52	1100	51
20-55	1500	32	26-54	1510	40	27-51	1800	40	23-51	1700	44	23-50	0905	42	5-53	1235	46
11-56	1430	34	8-56	1430	32	30-53	1450	45	30-52	1710	43	2-53	1245	41	17-54	1630	48
13-59	1500	34	10-59	1500	32	26-54	1600	41	25-54	1630	44	30-53	1300	44	15-55	1300	47
16-61	1130	38	6-61	0930	37	8-55	1430	32	11-55	1220	38	10-55	1300	38	5-56	1000	44
16-62	1230	32	20-62	1200	32	13-56	1100	33	18-56	1000	36	14-56	1300	48	21-56	1000	48
14-63	1300	34	11-63	1100	34	11-57	1200	33	29-58	1230	44	10-57	1100	43	19-57	1000	48
21-64	1100	34	20-64	1030	35	10-59	1530	35	17-59	1300	40	14-58	1400	44	17-58	1400	56
			4-65	1625	37	10-60	1530	37	14-60	1315	42	23-58	1430	54	5-59	1500	44
						9-61	1300	40	5-61	1145	38	19-59	1400	42	18-59	1430	49
						13-62	1100	36	20-62	1500	41	10-60	1000	44	2-60	0750	44
						15-63	1200	37	23-63	1130	40	2-61	0840	42	20-60	0815	46
						21-64	1530	44	21-64	1230	41	23-61	1200	40	7-61	0800	43
						2-65	1440	37	21-65	1345	39	28-61	1605	48	15-61	0930	47
						30-65	1550	42				15-62	1400	44	5-62	1130	43
												28-63	1100	44	25-62	1200	49
												8-64	1530	45	20-63	1100	51
												19-64	0830	40	3-64	1100	48
															19-64	0730	46
															2-65	1030	47
July			August			September			October			November			December		
8-49	1830	61	5-49	1100	60	19-51	1230	56	23-51	1550	43	7-49	1800	38	16-49	1300	32
16-52	1600	63	28-52	1200	61	3-53	1400	56	8-52	1800	50	11-52	1100	39	13-52	1305	38
8-53	1200	56	10-53	1500	63	29-54	1300	49	1-53	1500	52	16-53	1630	43	19-56	1430	38
25-55	1230	57	17-54	1230	54	18-56	1300	58	27-54	1500	43	2-54	1530	42	9-58	1500	33
27-56	1200	62	22-56	1000	59	23-57	1400	56	12-55	1200	44	29-54	1430	37	16-59	1000	36
26-57	0800	57	28-57	0830	51	3-59	1030	50	24-56	1600	48	30-55	1000	38	6-60	1145	32
29-58	1400	66	19-58	1900	66	30-59	1700	48	2-58	1600	55	26-56	1330	38	17-62	1000	39
8-59	1500	53	5-59	1030	54	22-60	0920	47	29-59	0930	40	26-57	1430	40	20-63	1030	38
19-60	1435	68	16-60	1630	69	27-62	1300	53	12-60	1115	45	13-58	1600	41	20-64	1335	32
12-61	1000	61	9-61	1130	61	20-63	1230	56	11-61	1200	47	25-59	1200	36	21-65	1055	34
25-62	0900	58	27-62	1200	56	18-64	1315	49	25-62	1100	45	9-60	0945	35			
8-64	1600	58	21-63	0930	61	21-65	1625	52	22-63	0930	47	30-61	1230	35			
29-65	1350	62	16-64	0930	53				23-64	1425	44	16-62	1000	39			
			26-65	1500	56				13-65	1745	49	27-63	1200	42			
												19-64	1010	37			
												17-65	1410	42			

245. Kintla Lake near Polebridge, Mont.

Location.--Lat 48°58', long 114°19', in S½ sec.15, T.37 N., R.21 W., (unsurveyed), near middle of lake, 14 miles north of Polebridge. Altitude of lake is 4,000 ft (from topographic map).

Water temperature records available.--One vertical profile taken on Sept. 9, 1964.

Cooperation.--Records furnished by the National Park Service, Glacier National Park.



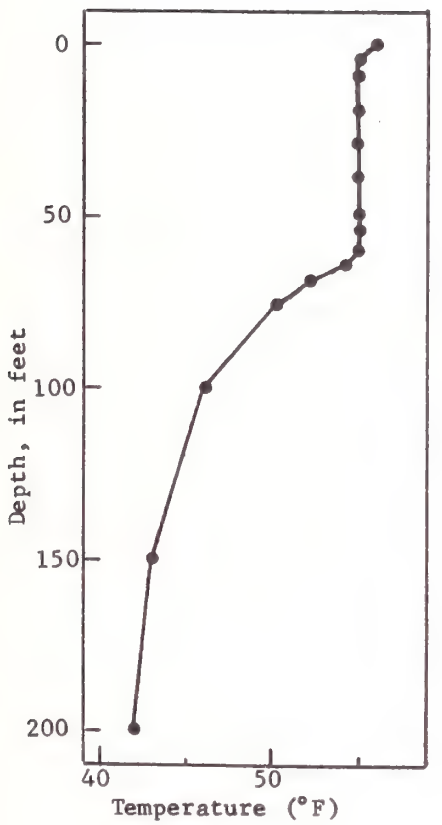
Depth, in feet	Temp. in Degrees F
Surface	56
5	55
10	55
20	55
30	55
40	55
50	54
55	52
60	51
65	49
70	48
75	48
100	46
150	42
200	41

246. Bowman Lake near Polebridge, Mont.

Location.--Lat 48°52', long 114°10', in sec.22, T.36 N., R.20 W., (unsurveyed), near middle of lake, 9 miles northeast of Polebridge. Altitude of lake is 4,020 ft (from topographic map).

Water temperature records available.--One vertical profile taken on Sept. 9, 1964.

Cooperation.--Records furnished by the National Park Service, Glacier National Park.



Depth, in feet	Temp. in Degrees F
Surface	56
5	55
10	55
20	55
30	55
40	55
50	55
55	55
60	55
65	54
70	52
75	50
100	46
150	43
200	42

247. Flathead River near Columbia Falls, Mont. (12-3555)

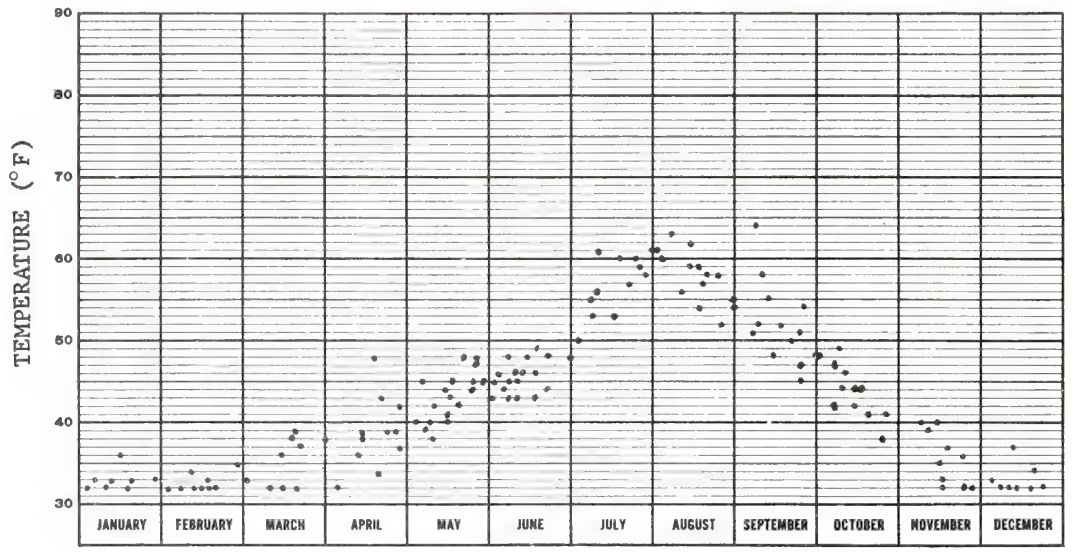
Location.--At gaging station, lat 48°29'40", long 114°07'40", near center of W½ sec.35, T.32 N., R.20 W., on right bank 1.5 miles downstream from Canyon Creek, 3.8 miles upstream from Middle Fork, 9 miles northeast of Columbia Falls, and at mile 162.1. Datum of gage is 3,145.59 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Drainage area.--1,548 sq mi.

Water temperature records available.--161 spot observations made at time of discharge measurements during period June 1949 to December 1965.

Extremes.--Discharge 1910-17, 1929-65: Maximum, 69,100 cfs June 9, 1964; minimum, 198 cfs Jan. 8, 1953.

Water temperatures 1949-65: Maximum observed, 64°F Sept. 9, 1958; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

247. Flathead River near Columbia Falls, Mont. (12-3555)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
19-53	1600	36	20-53	1600	32	24-53	1100	37	28-50	1130	37	9-52	1200	45	7-49	1600	45
13-55	1500	32	3-54	1500	32	16-54	1100	36	17-51	1200	39	21-53	1200	42	2-50	1500	43
23-56	1230	33	18-54	1200	33	10-55	1100	32	20-53	1600	48	12-54	1100	38	3-53	1400	45
22-57	1400	32	14-55	1130	32	21-58	1130	38	14-54	1300	38	17-54	1700	44	13-53	1330	48
3-58	1200	32	7-56	1230	32	22-61	1130	39	5-55	1030	32	22-54	1200	42	4-54	1130	46
30-59	1200	33	20-56	1300	32	16-62	1200	32	16-56	1200	36	12-55	1400	42	30-54	1200	48
13-60	1130	32	12-58	1200	32	23-64	1300	32	1-60	1230	38	17-56	1020	40	9-55	0930	45
13-61	1100	33	11-60	1230	34	2-65	1200	33	29-60	1120	42	10-57	1300	40	16-55	1200	46
8-63	1600	33	27-61	1315	35				24-61	1015	43	28-58	1400	48	7-57	1300	48
12-63	1400	32	18-64	1330	32				25-62	1200	39	4-59	1430	40	23-59	1030	48
22-64	1330	32	1-65	1605	33				17-63	1400	38	26-60	1140	45	6-60	0930	44
									27-64	1130	39	18-61	1200	43	20-60	1220	44
									21-65	1120	34	26-61	1900	44	13-61	1200	46
												29-61	1330	45	8-62	1200	48
												23-62	1200	48	12-62	1100	46
												17-63	1400	45	17-63	1930	49
												27-63	1700	47	8-64	1730	43
												8-64	1030	39	12-64	1700	43
												13-65	1740	42	16-64	1030	43
												15-65	1025	41	11-65	1050	46
July			August			September			October			November			December		
10-52	1700	61	14-51	1600	59	26-49	1300	47	28-49	1700	41	12-52	1600	39	4-49	1500	33
9-53	1630	56	14-52	1600	62	8-52	1230	51	10-52	1300	49	19-53	1130	37	12-52	1700	32
29-54	1630	58	7-53	1730	63	10-53	1530	58	12-53	1200	46	9-54	1600	40	17-52	1525	32
22-55	1100	57	27-54	1215	52	9-55	1030	52	8-54	1100	47	18-55	1100	32	18-53	1200	32
25-56	1130	60	24-56	1000	58	12-57	1200	55	7-55	1230	42	29-56	1030	37	10-54	1100	32
8-57	1030	55	31-56	1100	55	9-58	1300	64	1-56	1230	48	25-57	1500	36	23-55	1200	32
27-59	1200	59	21-57	1030	58	21-59	1400	50	8-57	1130	42	26-58	1220	32	7-59	1300	32
19-61	1130	60	4-58	1200	60	26-60	1300	54	16-58	1300	44	17-60	1030	33	22-60	1120	32
15-63	1000	53	18-59	1100	54	13-62	1230	48	16-59	1500	42	17-61	1100	32	22-61	1200	32
3-64	1130	50	1-60	1200	61	17-63	1400	52	21-60	0900	41	16-62	1530	35	11-62	1100	37
29-64	1100	58	31-60	1000	54	24-64	1600	51	18-61	1300	44	18-63	0950	35	18-63	1330	32
8-65	1450	53	20-63	1000	57	24-65	1110	45	11-62	1430	44	24-64	1200	36	18-64	0945	32
			18-64	1200	59				17-63	1030	44	15-65	1030	40	20-65	1125	34
			13-65	1150	56				27-64	1650	38						

248. Skyland Creek near Essex, Mont. (12-3560)

Location.--At gaging station, lat 48°17'30", long 113°23'10", in SE¼NW¼ sec.9, T.29 N., R.14 W., on left bank 150 ft upstream from mouth and 10 miles east of Essex. Datum of gage is 4,835.83 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

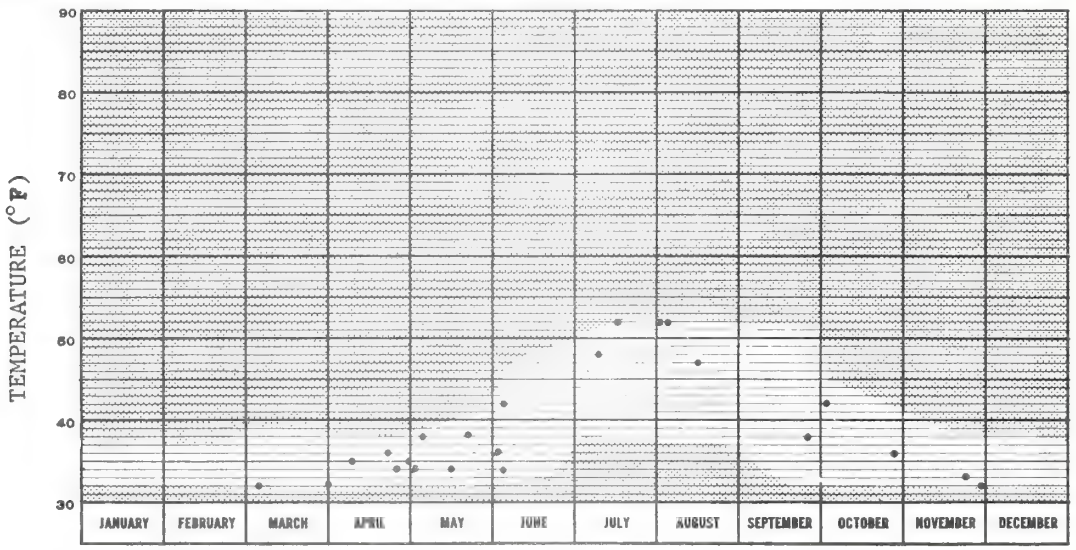
Drainage area.--8.09 sq mi.

Water temperature records available.--20 spot observations made at time of discharge measurements during periods March 1949 to October 1952 and April to June 1960-65. Thermograph record during periods March to September 1947, October 1948 to June 1950 and twice-daily observations October 1950 to May 1951 published in this report.

Extremes.--Discharge 1946-52, 1954, 1959-65: Maximum, 3,580 cfs June 8, 1964.
Discharge 1946-52: Minimum, 0.1 cfs Nov. 15, 1946.
Water temperatures 1947-52: Maximum, 52°F July 11, 15, Aug. 2, 4, 1949; minimum, freezing point on many days during winter months.

Remarks.--Temperatures from thermohm recorded at 12-minute intervals on micromax chart. Furnished temperatures of less than 32°F are published as 32°F.

Cooperation.--Thermograph record and twice-daily observations furnished by Corps of Engineers.



Spot observations of water temperatures, 1949-52.
The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record and twice-daily observations, 1947-51.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						31-49	1100	32	21-52	1430	36	5-60	1340	38	3-50	1100	34
						6-50	1330	32	29-52	1010	35	19-61	1015	38	4-52	1200	42
									12-60	1300	35	1-64	1250	34	1-60	1430	36
									26-62	1300	34	13-65	1530	34			
July			August			September			October			November			December		
8-52	1240	48	15-52	1200	47	26-51	1300	38	28-49	0830	36	29-49	1100	32			
									2-52	1445	42	23-51	1330	33			

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248. Skyland Creek near Essex, Mont. (12-3560)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures from thermograph record (°F), March to September 1947																																
March																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	34	34	34	34	34	34	34	33	34	33	34	34	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	33	33	32	32	32	33	32	32	33	32	33	34	--
April																																
Maximum.....	34	35	33	33	33	33	34	34	34	33	34	34	35	35	37	35	36	35	35	35	35	36	36	37	37	37	37	37	36	36	-	35
Minimum.....	33	33	33	32	32	32	33	33	32	33	33	32	33	33	34	33	32	34	34	34	34	33	34	34	34	34	33	33	34	34	-	33
May																																
Maximum.....	37	36	39	37	36	37	37	39	35	37	37	37	38	37	38	38	38	38	38	39	38	38	39	39	41	41	38	40	41	41	39	38
Minimum.....	35	33	34	34	34	35	35	34	33	35	35	35	35	35	35	35	35	35	36	35	34	35	35	36	36	36	36	34	36	37	37	35
June																																
Maximum.....	40	39	39	40	41	40	40	40	39	39	40	43	40	41	43	43	44	45	44	43	44	43	44	45	43	42	42	39	41	45	-	42
Minimum.....	36	37	37	38	37	37	36	37	37	37	38	37	38	38	37	39	39	39	40	38	36	38	38	40	41	40	39	38	38	38	-	38
July																																
Maximum.....	46	47	46	45	47	48	49	49	49	48	46	49	49	49	50	49	49	49	50	50	50	50	50	49	48	48	49	47	47	48	49	48
Minimum.....	38	40	40	39	38	41	42	41	41	42	42	41	42	42	43	42	42	42	43	43	43	43	44	43	42	40	42	42	41	40	42	41
August																																
Maximum.....	50	50	48	48	46	48	49	49	47	45	45	44	44	46	46	45	46	47	46	46	47	45	42	44	45	48	45	45	45	44	44	46
Minimum.....	43	43	43	43	42	41	42	41	42	40	40	41	40	41	42	42	41	41	41	42	43	44	41	41	40	40	40	41	41	43	42	42
September																																
Maximum.....	45	46	46	45	46	43	43	42	43	43	44	44	44	42	41	40	34	34	35	37	39	39	41	41	41	42	42	41	50	51	-	42
Minimum.....	41	42	43	42	43	40	41	40	41	40	41	40	39	36	38	34	32	32	34	35	36	36	37	37	39	39	40	39	39	48	-	39
Water temperatures from thermograph record (°F), October to December 1948																																
October																																
Maximum.....	38	39	41	41	39	35	41	39	36	37	37	39	38	40	40	34	34	35	36	36	37	37	37	39	38	38	36	33	33	34	34	37
Minimum.....	35	35	37	37	35	34	35	34	33	33	34	35	36	35	34	32	32	32	32	33	33	34	34	37	36	36	33	32	32	32	33	34
November																																
Maximum.....	34	34	34	34	33	33	33	33	33	33	34	33	33	34	33	33	32	33	33	33	33	33	33	33	33	33	32	32	32	32	-	33
Minimum.....	33	33	33	33	33	32	32	32	32	33	33	33	33	33	33	32	32	32	32	33	33	33	33	32	32	32	32	32	32	32	-	33
December																																
Maximum.....	33	33	32	32	32	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Minimum.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32

PEND OREILLE RIVER BASIN

248. Skyland Creek near Essex, Mont. (12-3560)
Water temperatures from thermograph record (°F), calendar year 1949

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32
Minimum.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February																																
Maximum.....	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
Minimum.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	-	-	-	32
March																																
Maximum.....	32	32	33	33	33	33	33	33	32	32	32	32	32	32	32	32	32	33	33	33	32	32	33	33	33	33	32	32	32	32	32	32
Minimum.....	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
April																																
Maximum.....	32	32	33	33	33	33	33	33	33	33	32	32	32	33	34	34	34	34	34	33	34	34	35	34	34	35	36	35	34	33	-	33
Minimum.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	33	33	32	33	32	-	32
May																																
Maximum.....	34	34	34	35	35	37	36	35	35	35	35	34	34	34	35	36	34	34	37	38	37	36	34	39	40	40	40	39	39	38	38	36
Minimum.....	32	33	33	32	32	33	32	32	32	32	33	32	32	33	33	33	33	32	33	34	35	33	32	33	34	36	35	36	35	36	36	33
June																																
Maximum.....	38	38	41	42	43	44	45	43	44	47	46	43	45	45	43	41	41	43	42	44	45	45	44	44	45	45	45	45	43	46	-	44
Minimum.....	36	37	37	36	37	38	38	37	38	39	40	37	38	39	39	36	36	33	37	37	39	41	40	42	40	41	40	40	39	38	-	38
July																																
Maximum.....	48	49	50	49	49	49	46	48	50	51	52	49	50	51	52	48	46	49	47	--	47	48	49	46	45	45	44	47	48	50	50	48
Minimum.....	39	41	41	42	43	43	41	41	41	43	44	45	43	43	44	45	42	43	43	--	42	42	42	44	42	43	42	41	41	43	43	42
August																																
Maximum.....	50	52	51	52	50	51	46	48	47	49	49	48	47	47	48	49	49	50	49	50	49	49	45	46	46	45	47	47	47	47	47	48
Minimum.....	44	45	45	45	44	43	43	42	41	42	43	44	43	40	40	42	43	44	44	42	43	42	44	42	41	40	37	40	42	41	41	42
September																																
Maximum.....	48	46	46	46	46	46	45	45	45	42	37	--	--	42	43	41	41	42	43	41	42	42	42	43	44	42	42	41	44	44	-	43
Minimum.....	42	43	39	42	42	42	40	40	40	34	34	--	--	36	39	38	38	38	37	39	37	38	38	40	41	39	38	38	40	42	-	39
October																																
Maximum.....	44	45	40	41	41	38	37	36	36	36	36	38	38	38	38	41	34	34	34	34	34	36	36	36	36	37	38	39	38	36	36	37
Minimum.....	42	38	38	37	38	36	34	34	34	35	36	36	35	35	35	35	32	32	32	33	32	33	33	33	33	34	36	37	35	34	34	35
November																																
Maximum.....	35	36	35	35	34	35	34	35	36	36	35	34	36	37	37	34	34	38	38	34	34	36	36	38	37	38	38	35	35	35	-	36
Minimum.....	32	33	32	32	32	32	32	32	32	33	32	32	34	35	33	33	32	33	32	32	32	33	35	34	34	35	35	33	32	33	-	33
December																																
Maximum.....	36	34	35	32	32	33	33	35	34	35	34	34	33	32	33	32	32	34	32	32	38	34	35	36	35	33	33	--	34	36	36	34
Minimum.....	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	--	32	32	32	32

248. Skyland Creek near Essex, Mont. (12-3560)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Water temperatures from thermograph record (°F), January to June 1950																														
January																														
Maximum.....	34	36	37	34	34	34	32	32	35	36	36	37	35	35	36	34	32	34	33	32	35	34	33	32	33	32	32	34	33	--	32	34
Minimum.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	--	32	32
February																														
Maximum.....	33	32	34	33	33	33	33	34	33	33	32	34	34	34	35	36	34	34	35	35	35	36	37	36	36	36	33	34	-	-	-	34
Minimum.....	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	33	33	32	34	33	32	33	33	32	32	-	-	-	32
March																														
Maximum.....	34	35	39	34	34	34	37	35	35	34	34	34	33	33	32	34	32	32	32	33	33	33	33	33	34	34	34	34	34	34	34	34
Minimum.....	32	32	33	33	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	32	32	32	32
April																														
Maximum.....	33	34	33	33	34	34	33	34	35	35	35	35	35	35	35	35	34	35	36	36	36	35	38	36	35	35	35	34	35	36	-	35
Minimum.....	32	32	32	32	32	33	32	32	33	33	33	33	32	33	34	34	33	32	32	33	33	34	33	33	33	33	33	33	33	33	-	33
May																														
Maximum.....	35	35	34	35	35	36	36	36	36	35	35	35	34	35	36	36	37	36	37	36	--	37	36	37	37	37	36	36	36	37	37	36
Minimum.....	33	34	33	33	34	34	35	35	34	33	33	32	32	33	33	34	34	34	34	35	--	33	34	34	36	35	35	35	36	36	35	34
June																														
Maximum.....	36	37	38	37	36	36	--	--	--	--	39	36	37	38	39	37	37	38	38	40	39	38	38	39	38	41	41	41	42	42	-	38
Minimum.....	35	36	36	35	35	35	--	--	--	--	35	34	35	36	35	35	36	36	36	35	36	35	36	36	36	34	36	38	38	38	-	36
Observed water temperatures (°F), October to December 1950																														
October																														
Morning	32	32	32	35	36	36	36	37	37	36	37	--	--	--	--	--	--	37	37	35	--	--	--	33	35	--	--	--	--	--	--	--
Afternoon	33	34	34	36	39	35	38	39	38	37	37	--	--	--	--	--	38	38	--	--	34	34	34	34	--	35	--	--	--	--	--	--
November																														
Morning	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Afternoon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
December																														
Morning	--	--	--	--	--	--	--	--	--	--	34	34	34	33	33	34	35	34	34	35	35	35	35	35	--	32	33	33	33	34	32	--
Afternoon	--	--	--	--	--	--	--	--	--	34	34	34	34	32	34	34	34	34	35	35	--	35	35	35	--	33	33	33	34	34	32	--

PEND OREILLE RIVER BASIN

248. Skyland Creek near Essex, Mont. (12-3560)

Observed water temperatures (°F), January to May 1951

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Morning	--	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	--
Afternoon	--	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	32	32	--	32	32	32	--
February																																
Morning	32	32	--	32	32	32	32	33	32	--	--	--	32	32	32	32	33	--	33	33	32	32	32	--	--	32	32	32	-	-	-	--
Afternoon	--	32	--	--	32	32	32	33	32	32	--	32	32	32	32	33	--	--	33	34	33	32	32	--	--	33	32	32	-	-	-	--
March																																
Morning	32	--	--	--	32	--	32	--	--	--	--	--	32	33	33	32	32	--	32	33	33	33	33	--	--	--	33	32	32	34	34	--
Afternoon	32	--	--	--	32	32	32	--	--	--	--	--	32	33	33	32	32	--	33	33	34	34	33	--	34	34	34	33	34	34	34	--
April																																
Morning	34	--	34	34	33	34	--	34	33	33	33	33	34	--	--	33	34	32	32	--	--	--	34	32	33	34	--	--	35	32	-	--
Afternoon	34	--	35	35	34	35	--	--	34	34	35	35	35	--	--	35	35	32	32	--	--	--	35	35	36	36	--	--	35	32	-	--
May																																
Morning	--	--	--	35	35	34	34	35	35	35	36	35	--	35	36	--	35	--	--	--	38	36	36	38	--	--	--	--	--	--	--	--
Afternoon	--	--	36	37	36	34	35	35	36	35	35	--	--	35	37	--	36	--	--	--	37	37	36	--	--	--	--	--	--	--	--	--

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1947	Max	--	--	--	37	41	45	50	50	51	--	--	--
	Min	--	--	32	32	33	36	38	40	32	--	--	--
1948	Max	--	--	--	--	--	--	--	--	--	41	34	33
	Min	--	--	--	--	--	--	--	--	--	32	32	32
1949	Max	33	33	33	36	40	47	52	52	48	45	38	38
	Min	32	32	32	32	32	33	39	37	34	38	32	32
1950	Max	37	37	39	38	37	42	--	--	--	39	--	35
	Min	32	32	32	32	32	34	--	--	--	32	32	32
1951	Max	34	32	34	36	37	--	--	--	--	--	--	--
	Min	32	32	32	32	34	--	--	--	--	--	--	--
Extremes for years 1947-51													
	Max	37	37	39	38	41	47	52	52	51	45	38	38
	Min	32	32	32	32	32	33	38	37	32	32	32	32

249. Middle Fork Flathead River at Essex, Mont. (12-3570)

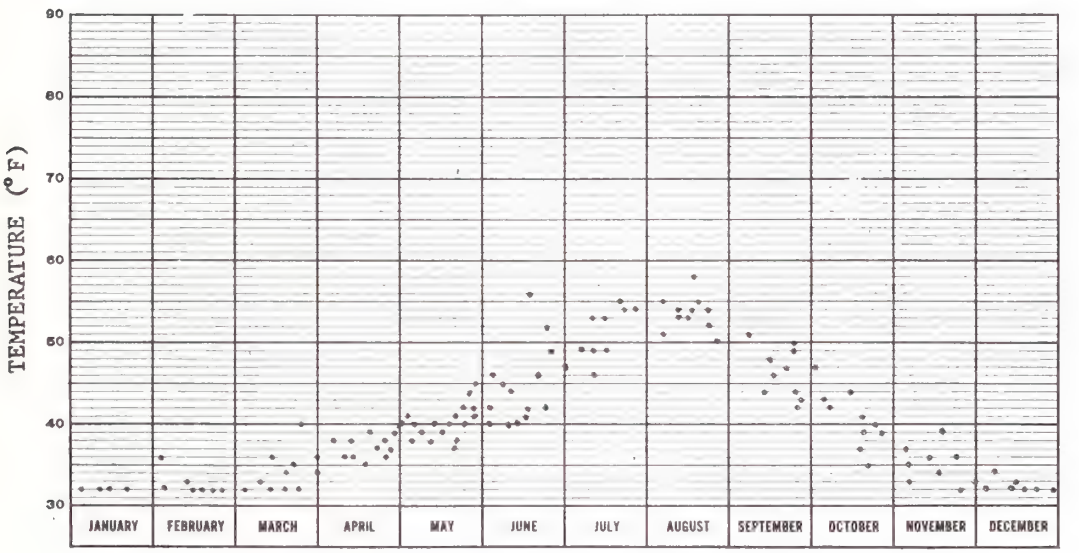
Location.--At gaging station, lat 48°16'30", long 113°36'10", in NE¼SW¼ sec.14, T.29 N., R.16 W., on right bank 0.6 mile upstream from Ole Creek, 0.7 mile southeast of Essex, and 4 miles downstream from Bear Creek. Datum of gage is 3,721.93 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Drainage area.--510 sq mi.

Water temperature records available.--139 spot observations made at time of discharge measurements during periods May 1949 to October 1953, June 1956 to October 1964.

Extremes.--Discharge 1939-53, 1956-64: Maximum, 75,300 cfs June 8, 1964; minimum daily, 30 cfs Jan. 22, 1940.

Water temperatures 1949-53, 1956-64: Maximum observed, 58°F Aug. 18, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-53, 1956-64

249 . Middle Fork Flathead River at Essex, Mont. (12-3570)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
4-50	1430	32	3-53	1630	36	31-50	0900	34	27-50	1000	37	1-49	1530	40	4-52	0900	46
21-59	1300	32	19-57	0900	32	27-52	1630	40	21-52	1200	37	17-49	1600	40	4-53	1400	42
14-60	1300	32	4-58	1100	32	4-53	1600	32	29-52	1300	39	23-50	1630	42	9-53	1200	40
20-61	1300	32	20-59	1300	32	19-57	1200	32	7-53	1400	38	28-50	1400	42	12-56	1130	40
10-62	1230	32	17-61	1200	32	12-58	1330	33	26-57	1200	36	8-53	1530	39	10-57	1300	44
13-63	1200	32	15-62	1130	32	20-59	1230	34	8-58	0930	38	6-58	1030	40	20-57	1040	46
20-64	1200	32	13-63	1400	33	18-60	1605	32	12-60	1500	38	20-58	1200	41	3-58	1000	42
			24-64	1100	32	22-60	1600	35	10-61	1400	36	11-59	1230	38	24-58	1000	52
						31-60	1630	36	12-62	1130	36	15-59	1130	39	3-59	1200	40
						15-61	1000	36	26-62	1130	38	5-60	1005	38	15-59	1530	42
						14-62	1430	32	19-63	1400	39	23-60	0940	38	7-60	1630	45
						14-63	1030	32	16-64	1100	35	3-61	1400	41	22-60	1500	42
						23-64	1100	32				19-61	1230	41	4-61	1030	42
												27-61	1500	44	26-61	1100	49
												29-61	1700	45	14-62	1030	41
												24-62	1100	40	17-63	0930	56
												14-63	1000	39			
												28-63	1200	41			
												13-64	1230	40			
												22-64	1200	37			
July			August			September			October			November			December		
12-51	1130	46	15-52	1100	53	23-49	1130	49	23-51	1640	35	30-49	1230	33	30-52	1500	32
8-52	1000	49	17-53	1100	54	26-51	1530	43	2-52	1100	47	6-52	1130	37	20-56	1110	32
15-53	1300	53	13-56	1200	53	17-56	1200	48	6-53	1130	43	26-52	1115	32	5-57	1100	32
12-56	1330	53	22-57	0800	54	8-58	0800	51	17-56	1300	44	7-57	1000	35	17-58	1330	32
23-57	1700	54	7-58	1030	55	25-58	0900	42	22-58	0930	39	19-57	1100	34	17-59	1500	33
22-58	0900	55	25-59	1135	50	24-59	1200	44	26-59	1430	40	21-58	1630	39	23-60	1330	32
1-59	1330	47	18-60	1515	58	21-60	1130	47	28-60	1100	39	27-59	1230	32	6-61	1200	32
22-59	1330	55	19-61	1100	55	14-61	0930	44	8-62	1130	42	25-60	1200	36	10-62	1200	34
28-60	0830	54	13-62	1200	54	18-62	1130	46	21-63	1100	41	7-61	1530	33	16-63	1230	32
23-61	2000	55	22-63	1430	52	23-63	1100	50	20-64	0940	37	15-62	1200	36			
12-62	1100	49	7-64	1100	51							19-63	1130	34			
16-63	1030	49															

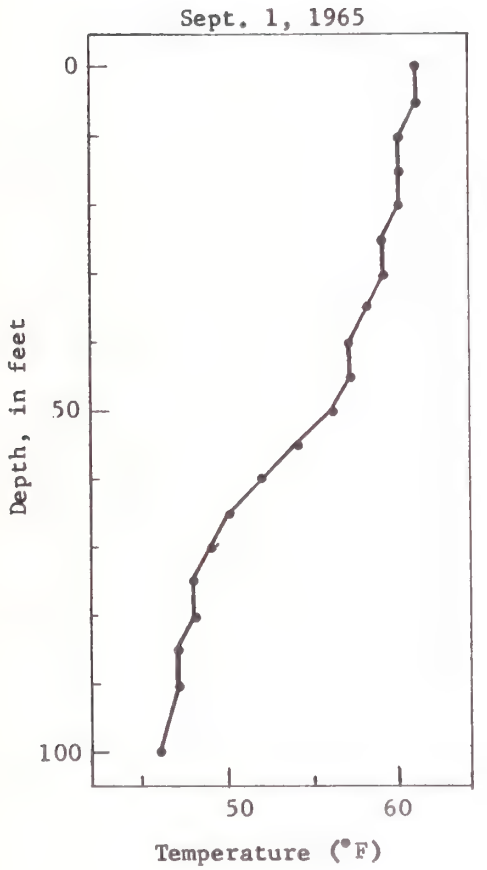
250. Lake McDonald near West Glacier, Mont.

Location.--Lat 48°33', long 113°58', in SW¼ sec.12, T.32 N., R.19 W., (unsurveyed), 1 mile upstream from outlet and 3 miles north of West Glacier. Altitude of lake is 3,144 ft (from topographic map).

Drainage area.--175 sq mi.

Water temperature records available.--One vertical profile taken on Sept. 1, 1965.

Cooperation.--Records furnished by the National Park Service, Glacier National Park.



Depth, in feet	Temp. in Degrees F
Surface	61
5	61
10	60
15	60
20	60
25	59
30	59
35	58
40	57
45	57
50	56
55	54
60	52
65	50
70	49
75	48
80	48
85	47
90	47
100	46

251. Middle Fork Flathead River near West Glacier, Mont. (12-3585)

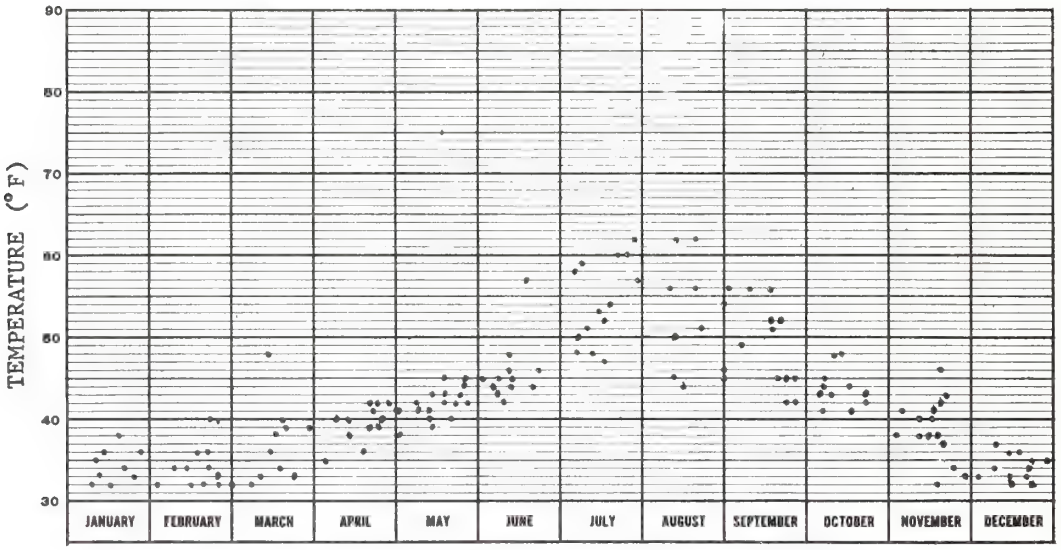
Location.--At gaging station, lat 48°29'50", long 114°00'30", in SW¼NE¼ sec.34, T.32 N., R.19 W., on left bank 0.8 mile downstream from McDonald Creek, 1¼ miles west of West Glacier, and 3.8 miles upstream from mouth. Altitude of gage is 3,130 ft (from river-profile map).

Drainage area.--1,128 sq mi.

Water temperature records available.--165 spot observations made at time of discharge measurements during period May 1949 to December 1965.

Extremes.--Discharge 1939-65: Maximum, about 140,000 cfs June 9, 1964; minimum, less than 173 cfs Nov. 27, 1952.

Water temperatures 1949-65: Maximum observed, 62°F Aug. 20, 1953, Aug. 15, 1958, July 29, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

251. Middle Fork Flathead River near West Glacier, Mont. (12-3585)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
20-53	1100	38	3-50	1200	32	17-53	1300	36	16-52	1400	40	1-49	1510	41	2-53	1230	45
26-54	1500	33	20-53	1530	34	16-54	1500	48	22-53	1100	41	16-49	--	48	13-53	1600	46
17-55	1100	32	18-54	1430	36	10-55	1330	32	20-54	1430	42	28-50	1815	42	11-54	1100	42
23-56	1530	34	14-55	1400	34	20-56	1100	34	5-55	1300	35	13-52	1330	43	8-55	1430	45
18-57	1200	32	19-57	1000	32	19-57	1400	38	16-56	1600	38	8-53	1200	41	13-57	1030	44
16-58	1400	36	20-58	1400	36	21-58	1400	40	23-58	1200	42	12-54	1500	40	23-59	1500	46
29-59	1230	36	24-59	1200	32	1-60	1500	32	24-59	1330	39	17-54	1230	42	6-60	1025	44
14-60	1600	33	11-60	1500	34	30-60	1400	39	29-60	1250	42	20-54	1530	40	20-60	1500	44
13-61	1330	35	21-61	1400	40	22-61	1430	39	24-61	1300	42	22-54	1800	42	13-61	1430	48
10-62	1500	32	15-62	1500	32	14-62	1630	33	12-62	1630	40	18-55	1130	42	12-62	1500	46
13-63	1500	35	13-63	1630	34	23-64	1300	33	25-62	1500	40	7-56	1300	42	17-63	1230	57
20-64	1430	33	24-64	1400	33				19-63	1630	42	17-56	1600	43	8-64	1400	43
27-65	1545	36							16-64	1700	36	2-57	1200	38	11-65	1440	45
									22-65	1125	39	15-57	1530	43			
												12-58	1530	41			
												26-60	1500	45			
												18-61	1600	45			
												26-61	1430	44			
												24-62	1600	43			
												14-63	1330	43			
												28-63	1700	44			
												13-64	1630	41			
												21-64	1200	40			
												13-65	1330	39			
July			August			September			October			November			December		
13-49	1000	51	14-52	1300	45	26-51	1400	45	10-52	1100	48	3-49	1630	38	3-49	1400	33
10-52	1400	59	17-53	1615	44	17-53	1600	56	12-53	1500	48	16-51	1500	40	22-52	1330	35
17-53	1000	47	20-53	1435	62	17-53	1600	56	7-54	1130	45	6-52	1530	41	18-53	1530	36
8-54	1330	48	31-54	1100	54	2-55	1030	56	6-55	1100	41	26-52	1630	34	15-54	1130	36
30-54	1530	57	20-57	1130	56	8-55	1100	49	7-57	1400	44	19-53	1400	46	23-55	1500	32
14-55	1130	48	15-58	1300	62	24-56	1500	42	16-58	1530	44	12-54	1130	40	20-56	1500	33
25-56	1500	60	31-60	1200	46	11-57	1400	56	16-59	1200	41	18-55	1500	32	10-57	1130	34
18-57	1100	54	13-62	1500	56	18-58	1100	51	21-60	1100	42	29-56	1500	33	22-60	1315	35
27-59	1600	60	23-63	0930	51	26-60	1500	42	9-61	1600	43	12-57	1200	38	15-61	1200	33
29-60	1200	62	31-64	1200	45	19-61	1230	45	8-62	1330	44	25-58	1030	43	10-62	1500	37
19-61	1630	52	13-65	1455	50	18-62	1400	52	21-63	1330	43	23-60	1100	42	16-63	1500	32
6-62	1030	58				23-63	1300	52	6-64	1750	43	17-61	1400	38	29-64	1400	35
16-63	1600	53				24-65	1430	45				15-62	1500	38	20-65	1050	34
8-65	1145	50										19-63	1330	37			
												15-65	1325	41			

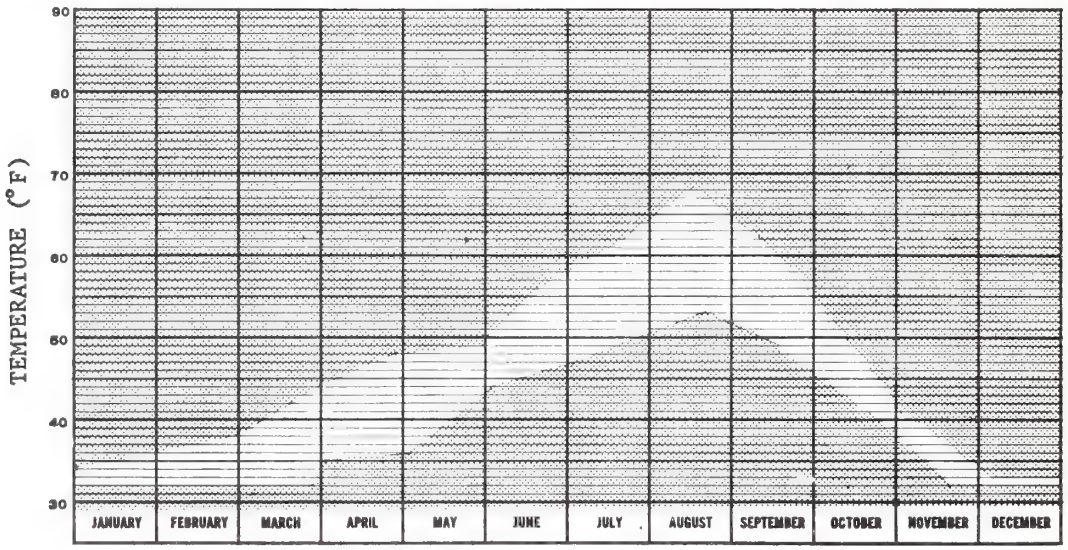
252. Flathead River near Coram, Mont.

Location.--At thermograph site, lat 48°27'55", long 114°04'10", in SE¼NE¼ sec.7, T.31 N., R.19 W., on left bank 60 ft upstream from Blankenship Bridge, a quarter of a mile downstream from Middle Fork, and 3½ miles northwest of Coram. Altitude of gage is 3,100 ft (from river-profile map).

Water temperature records available.--Thermograph record during period January 1963 to May 1964 published in this report. Thermograph lost during flood of June 1964.

Extremes.--Temperatures 1963-64: Maximum, 68°F Aug. 13, 14, 1963; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1963-64.

PEND OREILLE RIVER BASIN

252. Flathead River near Coram, Mont.
Water temperatures (°F), calendar year 1963

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																															
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	--
February																															
Maximum.....	32	32	32	32	32	32	32	32	33	33	34	33	33	33	34	34	35	35	34	36	36	36	37	38	37	38	38	36	-	-	-	34
Minimum.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	34	34	34	34	34	35	35	34	36	37	35	-	-	-	33
March																															
Maximum.....	36	37	36	36	36	37	37	36	38	38	38	38	37	38	40	40	41	38	38	42	41	43	41	40	42	43	42	41	39	37	38	39
Minimum.....	35	34	33	32	34	35	34	34	33	36	35	34	35	34	37	37	36	37	37	37	38	39	39	39	37	38	40	39	37	36	35	36
April																															
Maximum.....	39	40	41	42	43	43	41	41	43	43	43	43	45	46	46	42	41	40	41	42	43	41	42	43	46	47	48	47	46	45	-	43
Minimum.....	38	35	36	40	40	41	39	38	39	39	39	39	40	41	42	37	36	37	37	38	38	38	39	40	40	42	43	43	41	43	-	39
May																															
Maximum.....	43	41	41	41	44	44	44	42	41	43	44	44	45	47	46	47	47	46	47	48	48	48	48	47	46	47	47	49	49	49	49	46
Minimum.....	40	38	38	39	40	42	41	40	40	40	40	41	41	42	42	42	42	43	41	43	43	43	43	44	44	44	44	44	45	45	45	42
June																															
Maximum.....	47	48	48	48	48	47	48	48	48	49	49	48	51	54	54	54	55	55	56	53	52	48	51	51	51	53	54	55	54	54	-	51
Minimum.....	44	45	46	46	46	45	45	46	46	46	46	47	45	48	50	50	50	50	51	49	48	46	45	48	49	47	49	51	46	46	-	47
July																															
Maximum.....	54	55	57	58	59	59	62	60	58	57	53	55	58	57	56	57	57	58	60	60	62	61	59	58	57	59	61	61	61	61	61	58
Minimum.....	47	51	52	53	54	54	56	57	53	53	51	50	52	53	54	52	53	53	54	55	56	57	54	54	54	51	55	56	55	56	56	54
August																															
Maximum.....	60	61	62	64	64	65	66	65	65	65	66	66	68	68	65	63	63	63	64	61	58	58	60	62	63	60	57	58	60	61	60	63
Minimum.....	57	55	56	58	58	59	60	60	60	61	59	61	62	63	62	58	58	59	59	56	54	53	55	57	58	56	53	53	55	56	56	58
September																															
Maximum.....	58	58	59	61	61	61	61	61	60	61	62	61	58	54	53	52	54	55	55	55	56	57	56	55	56	56	57	56	56	56	-	57
Minimum.....	56	56	56	56	56	56	56	56	57	55	57	57	54	51	50	50	49	50	50	50	51	53	53	52	51	51	52	52	52	52	-	53
October																															
Maximum.....	54	54	52	52	50	49	50	49	49	51	51	51	51	51	51	50	49	49	47	44	46	47	47	45	43	42	41	41	42	42	40	48
Minimum.....	51	50	50	50	49	48	47	46	47	47	47	48	47	47	47	46	46	45	44	42	43	46	45	43	41	40	39	39	40	39	39	45
November																															
Maximum.....	40	41	40	39	41	38	39	39	40	40	39	38	38	39	40	39	37	37	37	37	32	33	35	36	37	40	41	37	33	32	-	38
Minimum.....	37	38	37	37	38	37	37	37	38	37	37	36	37	38	39	37	37	37	37	32	32	32	33	35	36	37	37	34	32	32	-	36
December																															
Maximum.....	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	32	33	33	32	32	32
Minimum.....	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32

PEND OREILLE RIVER BASIN

252. Flathead River near Coram, Mont.

Water temperatures (°F), January to May 1964

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	34	34	33	33	33	32	32	32	32	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	33	33	32
Minimum.....	33	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February																																
Maximum.....	34	33	34	35	35	33	35	33	34	35	36	35	34	33	32	33	35	33	35	35	35	34	36	34	34	34	34	33	33	-	-	34
Minimum.....	32	32	32	32	33	32	32	32	32	34	34	33	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	-	-	32
March																																
Maximum.....	33	35	33	34	33	34	34	33	34	33	34	35	34	33	38	39	37	37	38	39	40	37	33	33	32	33	35	36	40	43	44	36
Minimum.....	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	36	36	34	36	35	37	32	32	32	32	32	32	32	32	36	37	33
April																																
Maximum.....	42	41	42	43	43	41	42	43	44	42	41	40	40	40	41	40	40	42	44	43	42	42	42	42	43	43	42	44	44	43	-	42
Minimum.....	38	38	37	39	40	37	37	40	40	40	39	38	38	39	40	36	36	36	38	40	40	38	38	40	40	41	39	39	40	40	-	39
May																																
Maximum.....	43	41	40	40	40	39	42	43	44	43	44	45	44	43	45	46	45	45	45	43	42	38	41	41	42	42	45	44	--	--	--	43
Minimum.....	39	37	36	38	38	38	38	41	40	40	40	40	42	39	40	41	42	40	41	38	38	37	37	38	37	39	41	41	--	--	--	38

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	38	43	48	49	56	62	68	62	54	41	33
	Min	32	32	32	35	38	44	47	53	49	39	32	32
1964	Max	34	36	44	44	46	--	--	--	--	--	--	--
	Min	32	32	32	36	36	--	--	--	--	--	--	--

253. South Fork Flathead River at Spotted Bear ranger station, near Hungry Horse, Mont. (12-3590)

Location.--At gaging station, lat 47°55'20", long 113°31'25", in SE¼SW¼ sec.17, T.25 N., R.15 W., on left bank 600 ft south of Spotted Bear ranger station, 1,000 ft upstream from Spotted Bear River, 40 miles southeast of Hungry Horse, and at mile 52.9. Altitude of gage is 3,670 ft (from river-profile map).

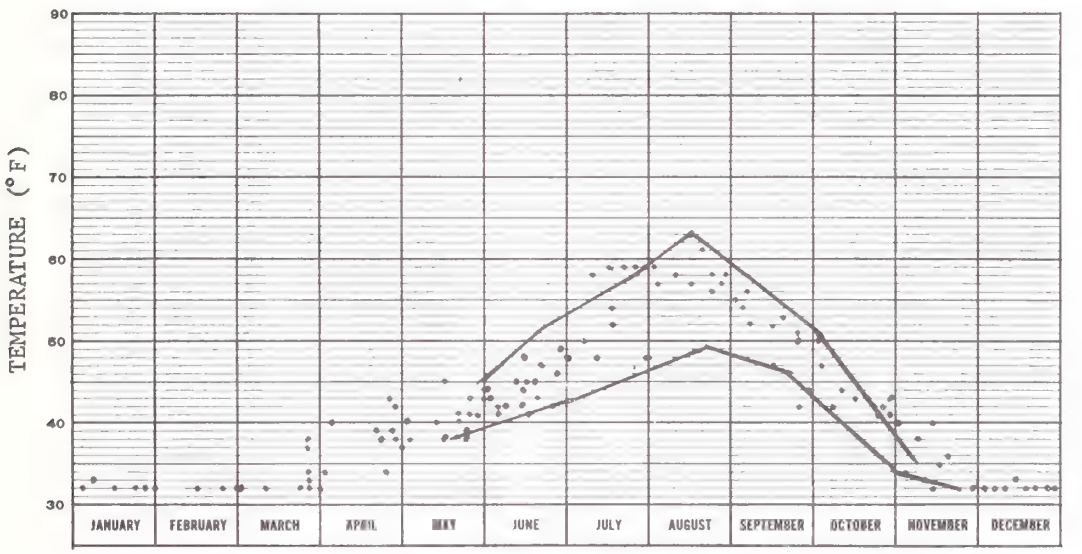
Drainage area.--958 sq mi.

Water temperature records available.--137 spot observations made at time of discharge measurements during periods March 1949 to September 1957, September 1959 to December 1965. Thermograph record during period May to September 1963 published in this report. Thermograph record during periods October to December 1963, May to June 1964 published in reports of the Geological Survey.

Extremes.--Discharge 1948-57, 1959-65: Maximum, 36,700 cfs June 8, 1964; minimum, less than 121 cfs Dec. 26, 1952.

Water temperatures 1949-57, 1959-65: Maximum, 63°F Aug. 15, 1961, Aug. 13, 14, 1963; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph record furnished by Corps of Engineers.



Spot observations of water temperatures, 1949-57, 1959-65. The lines connect the highest and lowest monthly temperatures from seasonal thermograph record, 1963-64.

253. South Fork Flathead River at Spotted Bear ranger station, near Hungry Horse, Mont. (12-3590)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-53	1030	32	25-53	0930	32	29-49	1630	32	28-49	1600	43	14-49	1900	40	10-49	1600	45
27-54	1800	32	27-55	0930	32	1-50	1630	32	30-52	1730	42	25-49	1500	43	5-53	0830	42
28-55	1200	32	28-57	1300	32	29-50	1100	37	2-53	1030	34	3-50	1030	38	17-53	0900	43
4-57	1300	32	28-62	0800	32	29-54	1800	32	28-53	1100	39	31-50	1000	43	25-54	0900	42
19-61	1300	32	27-64	0900	32	31-55	1100	32	29-54	1130	38	18-54	1600	45	1-55	1900	44
30-61	1450	32	16-65	0900	32	1-56	1300	32	29-55	1000	38	23-56	0900	41	13-55	2000	48
31-62	1730	32				29-56	1430	33	29-56	1400	38	28-56	1330	41	18-56	1530	47
30-63	1230	32				1-60	1130	32	30-57	0820	37	25-60	0900	41	13-57	1300	45
30-64	1000	32				11-60	1000	32	26-61	0930	34	25-61	1430	43	2-60	1300	44
10-65	1620	33				29-60	0900	33	24-62	1200	39	23-62	1515	40	4-60	0955	42
						29-61	1300	38	5-63	1400	40	2-63	1100	40	13-60	1045	44
						29-62	0900	34	24-64	0900	38	23-63	1500	41	28-60	1035	46
						27-64	0900	32				23-64	1200	38	15-61	1330	45
						24-65	1100	32				14-65	1230	38	13-62	1200	41
															3-63	1500	43
															28-63	1100	49
															5-64	1030	41
															16-64	1300	41
															7-65	1345	42
July			August			September			October			November			December		
1-52	1600	48	19-53	1415	61	4-52	0800	54	4-51	1450	47	1-49	1500	40	3-52	0905	32
30-52	1040	59	3-54	2000	57	22-53	1700	53	7-52	1000	42	4-52	0915	34	9-53	0900	32
20-53	1545	54	2-55	1500	59	7-54	1900	52	22-53	1430	42	12-53	1630	38	6-54	1030	32
23-56	1600	59	30-55	1300	58	19-55	0920	47	11-54	1530	44	15-54	1630	40	29-59	1300	32
11-57	1130	58	24-56	0830	58	6-57	1230	56	20-55	0900	43	15-55	1700	32	20-60	1530	32
27-60	0920	59	15-57	1100	57	29-59	1400	44	2-56	1500	50	18-60	1300	35	27-61	1030	32
18-61	1500	59	15-61	1300	63	2-60	1000	55	23-59	1530	41	13-61	1400	33	13-62	1330	33
20-62	1330	52	23-62	1300	56	27-60	1430	51	24-60	1200	42	20-62	1400	36	23-63	1200	32
31-63	1430	48	28-63	1300	57	18-61	1300	52	17-62	1400	43	29-63	1400	32			
6-64	1530	50	10-65	1400	58	19-62	1500	52	29-63	1400	41	19-64	1510	36			
12-65	1120	48				27-63	1030	50	30-65	1145	43						
						24-65	1400	42									

PEND OREILLE RIVER BASIN

253. South Fork Flathead River at Spotted Bear ranger station, near Hungry Horse, Mont. (12-3590)

Water temperatures (°F), May to September 1963

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	44	43	44	44	44	45	45	45	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	41	40	40	40	41	41	41	41	--
June																																
Maximum.....	44	44	44	44	44	43	43	44	44	44	44	45	--	48	48	48	49	50	51	50	48	44	44	44	44	48	48	47	46	46	-	46
Minimum.....	40	41	40	41	43	41	41	41	42	42	41	44	--	45	44	44	47	47	48	47	44	42	42	43	43	43	46	46	45	43	-	44
July																																
Maximum.....	49	51	53	54	54	54	55	57	57	55	51	50	52	52	52	51	50	51	55	55	57	58	57	57	57	57	57	57	56	57	59	54
Minimum.....	44	43	50	50	51	51	52	54	53	51	49	48	49	51	50	50	49	48	50	53	54	56	56	52	54	53	53	53	55	53	54	51
August																																
Maximum.....	59	60	60	61	62	--	--	--	63	61	60	61	63	63	61	60	59	58	60	58	57	54	57	60	59	58	57	57	56	58	58	59
Minimum.....	54	55	56	57	57	--	--	--	58	59	58	58	58	59	59	55	54	55	55	55	52	49	53	55	55	55	53	52	52	52	53	55
September																																
Maximum.....	57	55	54	57	58	58	57	57	57	58	58	58	57	55	51	48	50	50	50	49	50	52	52	51	50	50	51	51	51	51	-	53
Minimum.....	55	53	52	52	53	53	53	53	55	54	55	55	54	51	48	47	47	47	47	46	48	50	51	48	47	47	47	49	48	48	-	50

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	--	--	--	--	--	45	--	51	40	58	43	63	49	58	46	51	34	35	32	--	32
1964	Max	--	--	--	--	--	--	45	39	50	40	--	--	--	--	--	--	--	--	--	--	--	--

254. Spotted Bear River near Hungry Horse, Mont. (12-3595)

Location.--At gaging station, lat 47°55'40", long 113°31'10", near center of sec.17, T.25 N., R.15 W., on left bank a third of a mile upstream from mouth and 40 miles southeast of Hungry Horse. Altitude of gage is 3,690 ft (from river-profile map).

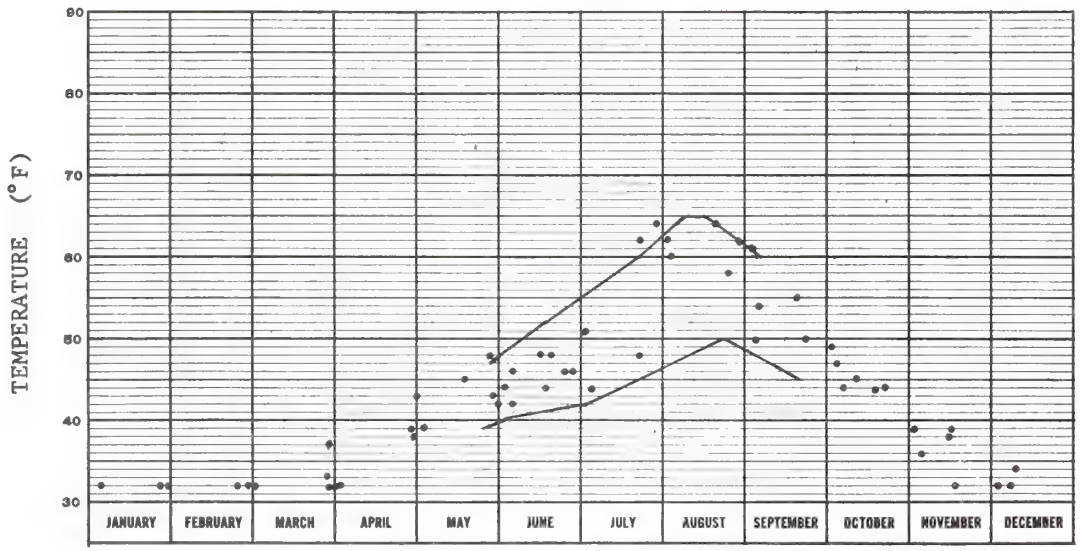
Drainage area.--184 sq mi.

Water temperature records available.--61 spot observations made at time of discharge measurements during period May 1949 to October 1956. Thermograph record during period May to September 1963 published in reports of the Geological Survey. Gage destroyed during flood of June 1964.

Extremes.--Discharge 1948-56, 1964: Maximum, 20,200 cfs June 8, 1964; minimum, 20 cfs Jan. 5, 1953.

Water temperatures 1949-56, 1963: Maximum, 65°F Aug. 9, 13, 14, 1963; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph records furnished by Corps of Engineers.



Spot observations of water temperatures, 1949-56.
The lines connect the highest and lowest monthly temperatures from seasonal thermograph record, 1963.

254. Spotted Bear River near Hungry Horse, Mont. (12-3595)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-53	0930	32	24-53	1000	32	1-50	1230	32	29-51	1100	39	25-49	1700	48	6-50	1430	46
27-54	1530	32	27-55	1200	32	29-50	1400	37	30-52	1530	43	3-50	1530	39	27-50	1030	46
28-55	1400	32				29-54	1630	32	2-53	0900	32	31-50	1400	42	6-53	1030	42
5-56	1030	32				31-55	1300	32	28-53	1400	39	18-54	1800	45	17-53	1200	44
						1-56	1000	32	29-54	1300	38	28-56	1500	43	24-54	1830	46
						29-56	0900	33	29-55	1130	39				1-55	1630	44
									29-56	1000	38				13-55	1630	48
															19-56	0900	48
July			August			September			October			November			December		
1-52	1430	51	19-53	1600	64	6-51	1100	50	4-51	1900	47	1-49	1300	39	3-52	1050	32
28-52	1515	64	3-54	1700	60	3-52	1555	61	7-52	1100	44	4-52	1130	36	9-53	1030	34
21-53	0830	48	2-55	1630	62	23-53	0900	50	2-53	1530	44	13-53	0900	38	6-54	1000	32
6-55	1300	44	30-55	1500	62	7-54	1700	54	11-54	1630	45	15-54	1600	39			
23-56	1900	62	24-56	1000	58	19-55	1700	55	19-55	1630	44	16-55	1230	32			
									2-56	1600	49						

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max					47	52	60	65	60			
	Min					39	40	42	50	45			

255. South Fork Flathead River above Twin Creek, near Hungry Horse, Mont. (12-3598)

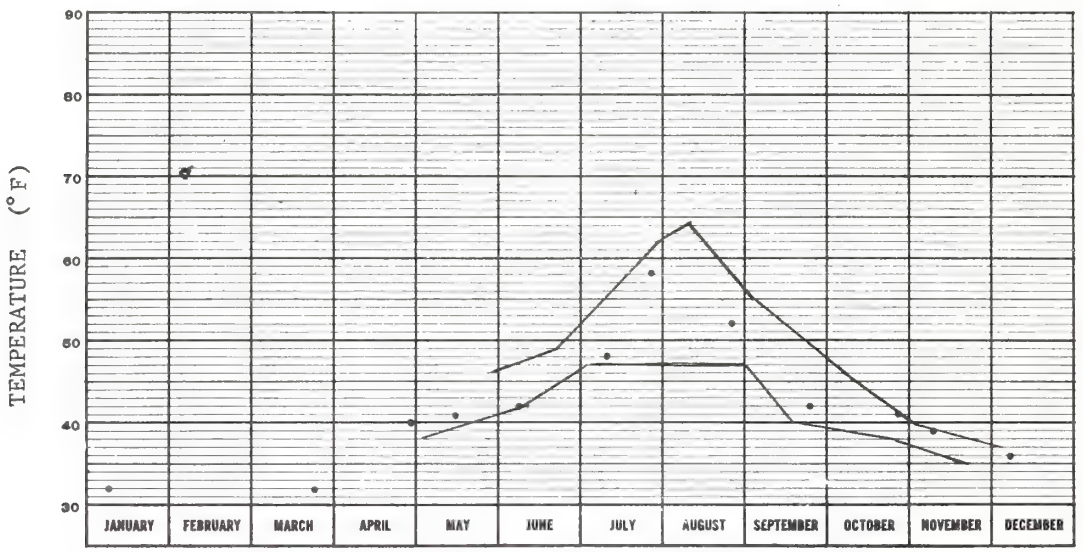
Location.--At gaging station, lat 47°58'45", long 113°33'50", in SE¼SW¼SE¼ sec.25, T.26 N., R.16 W., on left bank 1,000 ft downstream from Tin Creek, a quarter of a mile upstream from Twin Creek, 36 miles southeast of Hungry Horse, and at mile 46.5. Altitude of gage is 3,575 ft (from river-profile map).

Drainage area.--1,160 sq mi.

Water temperature records available.--12 spot observations made at time of discharge measurements during period January to December 1965. Thermograph record during period May to December 1965 (incomplete) published in reports of the Geological Survey.

Extremes.--Discharge 1964-65: Maximum, 50,900 cfs June 8, 1964; minimum daily, 250 cfs Dec. 16, 1964.

Water temperatures 1965: Maximum, 64°F between Aug. 3-16, 1965 (from recorded range in temperature); minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1965.
The lines connect the highest and lowest monthly temperatures from seasonal thermograph record, 1965.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
10-65	--	32				22-65	--	32	29-65	--	40	14-65	--	41	7-65	--	42
July			August			September			October			November			December		
12-65	--	48	27-65	--	52	24-65	1000	42	25-65	1450	41	10-65	1200	39	9-65	1245	36
27-65	--	59															

Summary of thermograph readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1965	Max	--	--	--	--	46	49	62	64	55	46	40	37
	Min	--	--	--	--	38	42	47	47	40	38	35	--

256 . Twin Creek near Hungry Horse, Mont. (12-3600)

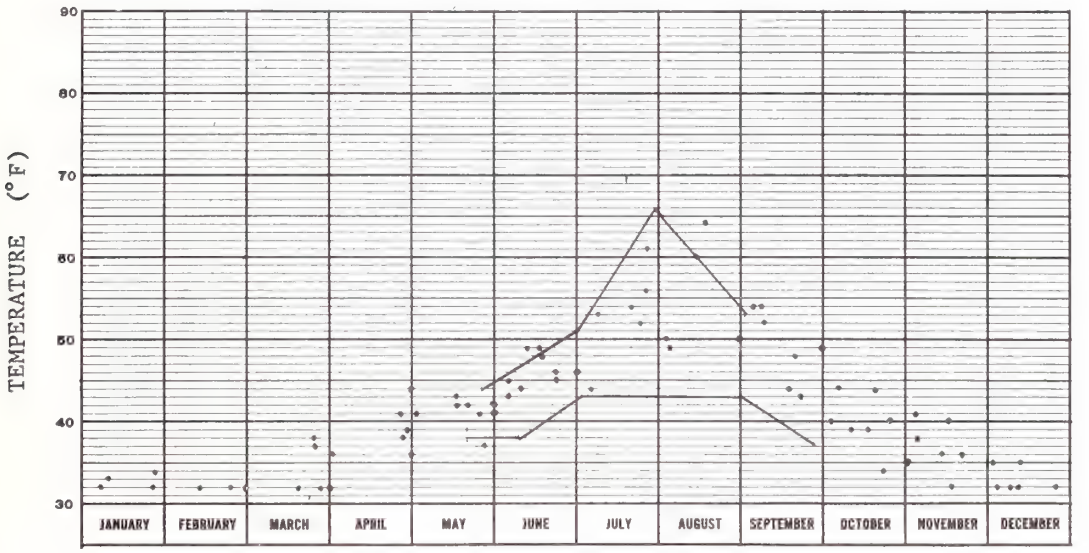
Location.--At gaging station, lat 47°59'10", long 113°33'30", in E½ sec.25, T.26 N., R.16 W., on left bank 300 ft upstream from road bridge, 0.1 mile upstream from mouth, and 36 miles southeast of Hungry Horse. Altitude of gage is 3,610 ft (from river-profile map).

Drainage area.--47.0 sq mi.

Water temperature records available.--78 spot observations made at time of discharge measurements during periods March 1949 to September 1956, October 1964 to December 1965. Thermograph record during period May to September 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1948-56, 1964-65: Maximum, 5,380 cfs June 8, 1964; minimum, 3.9 cfs Mar. 8, Nov. 26, 1952.

Water temperatures 1949-56, 1964-65: Maximum, 66°F July 30, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-56, 1964-65. The lines connect the highest and lowest monthly temperatures from seasonal thermograph record, 1965.

256. Twin Creek near Hungry Horse, Mont. (12-3600)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-53	1330	34	28-50	1500	32	29-49	0900	32	30-52	1400	44	26-49	1030	41	10-49	1900	44
27-54	1030	32	25-53	1200	32	28-50	1430	37	2-53	1130	36	2-50	1830	41	6-50	0900	45
28-55	1630	32	26-55	1330	32	29-54	1330	32	27-53	1600	41	20-52	1900	42	6-53	1330	43
7-56	1400	32	29-56	1500	32	28-56	1530	38	28-54	1730	38	18-54	1400	42	17-53	1500	49
10-65	1235	33	14-65	1435	32	22-65	1455	32	1-55	1130	32	1-56	1000	36	25-54	1130	46
									30-55	1000	36	18-56	1700	43	1-55	1330	42
									29-65	1230	39	29-56	0830	37	13-55	1500	49
															18-56	1300	48
															1-65	1020	41
															25-65	1145	45
July			August			September			October			November			December		
1-52	1230	46	19-53	1230	60	30-49	1000	49	7-52	1330	44	1-49	0930	35	2-49	1530	35
28-52	1345	61	4-54	1000	49	6-51	1300	54	23-53	0900	34	4-52	1425	38	3-52	1350	32
20-53	1400	54	3-55	0900	50	4-52	1045	54	12-54	0900	39	13-53	1000	36	8-53	1630	32
6-55	1130	44	31-55	0900	50	23-53	1030	48	20-55	1100	44	15-54	1400	40	6-54	0830	32
24-56	0830	52	23-56	1630	64	7-54	1530	52	3-56	0900	40	16-55	1400	32	9-65	1450	35
9-65	1205	53				20-55	0900	44	16-64	1150	39	19-64	1630	36	27-65	0930	32
27-65	1025	56				24-65	1445	43	26-65	1210	40	4-65	1050	41			

Summary of thermograph readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1965	Max					44	51	66	65	53			
	Min					38	38	43	43	37			

257. Lower Twin Creek near Hungry Horse, Mont. (12-3605)

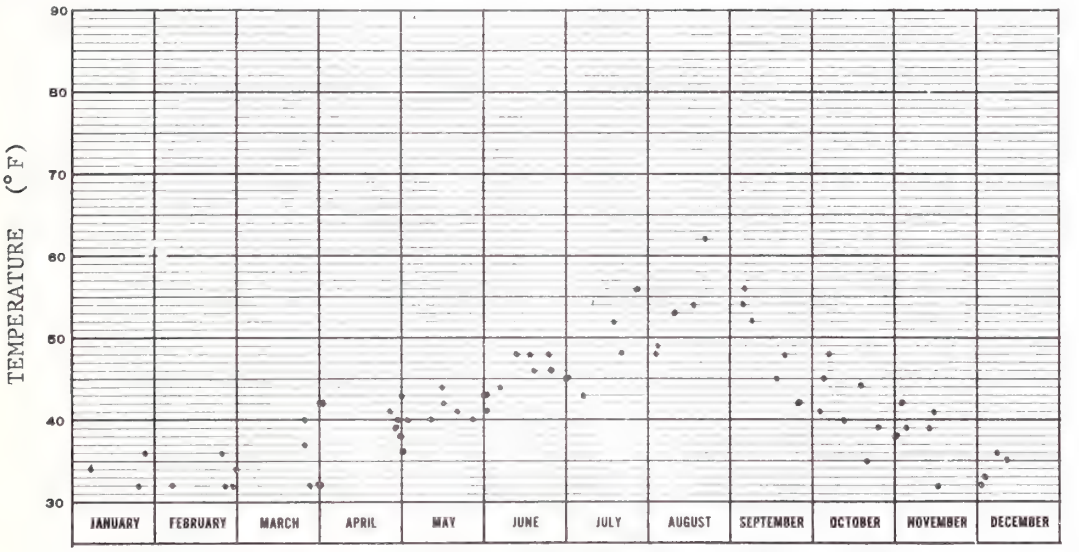
Location.--At gaging station, lat 47°59'40", long 113°33'20", in SE¼ sec.24, T.26 N., R.16 W., on left bank half a mile upstream from mouth and 35 miles southeast of Hungry Horse. Altitude of gage is 3,630 ft (from river-profile map). Gage destroyed in flood of June 8, 1964.

Drainage area.--22.4 sq mi.

Water temperature records available.--69 spot observations made at time of discharge measurements during periods April 1949 to October 1956, April to November 1965.

Extremes.--Discharge 1948-56, 1964: Maximum, 5,110 cfs June 8, 1964; minimum, 0.8 cfs Jan. 28, 1952.

Water temperatures 1949-56, 1965: Maximum observed, 62°F Aug. 23, 1956; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-56, 1965

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-53	1430	36	8-50	1100	32	28-50	1330	37	27-49	1630	41	14-49	1330	40	6-53	1500	44
27-54	1300	32	28-50	1430	32	29-54	1200	32	30-52	1300	43	26-49	1430	41	17-53	1600	48
28-55	1530	32	25-53	1230	36	28-56	1400	40	1-53	1500	42	2-50	1700	40	25-54	1220	48
7-56	1500	34	26-55	1200	32				29-53	1030	40	2-50	1800	40	1-55	1430	43
			29-56	1400	34				1-55	1030	32	30-50	1000	40	13-55	1300	48
									30-55	0900	38	18-54	1100	42	18-56	1130	46
									29-65	1100	39	1-56	1100	36	1-65	1145	41
												18-56	1530	44	25-65	1345	46
												29-56	0930	40			
July			August			September			October			November			December		
1-52	1130	45	19-53	1120	54	5-51	1430	56	5-51	0930	45	1-49	1030	38	2-49	1200	32
28-52	1205	56	4-54	1130	49	4-52	1200	54	7-52	1430	48	4-52	1535	39	3-52	1455	33
20-53	1140	52	3-55	1000	48	23-53	1130	48	23-53	1000	35	13-53	0930	39	8-53	1600	35
6-55	1000	43	23-56	1600	62	7-54	1430	52	12-54	1000	40	15-54	1400	41	6-54	0900	36
24-56	0900	48	10-65	1030	53	20-55	1030	45	20-55	1200	44	16-55	1500	32			
						24-65	1535	42	3-56	1000	41	4-65	1035	42			
									26-65	1110	39						

258. Soldier Creek near Hungry Horse, Mont. (12-3606)

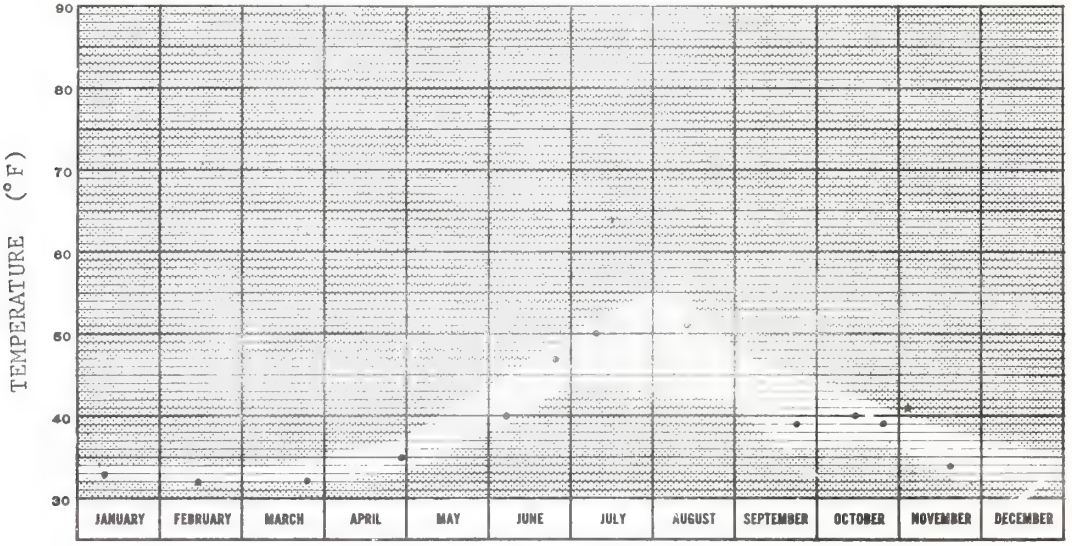
Location.--At gaging station, lat 47°59'30", long 113°34'50", in NE¼NE¼ sec.26, T.26 N., R.16 W., on left bank 200 ft upstream from culverts on west shore road, 0.2 mile upstream from mouth, and 35 miles southeast of Hungry Horse. Altitude of gage is 3,640 ft (from river-profile map).

Drainage area.--4.77 sq mi.

Water temperature records available.--13 spot observations made at time of discharge measurements during period October 1964 to December 1965. Thermograph record during period October 1964 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1964-65: Maximum, 206 cfs June 8, 1964; minimum daily, 3.0 cfs Sept. 8, 1965.

Water temperatures 1964-65: Maximum, 55°F July 30, Aug. 1-3, 9, 11, 12, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1964-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1964-65.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
11-65	--	33	15-65	--	32	23-65	--	32	29-65	--	35				7-65	--	40
															24-65	--	47
July			August			September			October			November			December		
9-65	--	50	13-65	--	51	23-65	1245	39	14-64	--	40	19-64	--	34			
									25-65	1400	39	4-65	1330	41			

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1964	Max	--	--	--	--	--	--	--	--	--	--	40	36
	Min	--	--	--	--	--	--	--	--	--	--	32	32
1965	Max	34	34	34	37	43	48	55	55	47	44	40-34	37
	Min	32	32	32	32	34	39	44	42	36	37		33

259. Sullivan Creek near Hungry Horse, Mont. (12-3610)

Location.--At gaging station, lat 48°01'45", long 113°42'10", in W½ sec.12, T.26 N., R.17 W., on left bank a quarter of a mile downstream from Quintonkon Creek, 1 mile upstream from Hungry Horse Reservoir flow line, and 30 miles southeast of Hungry Horse. Altitude of gage is 3,740 ft (from topographic map).

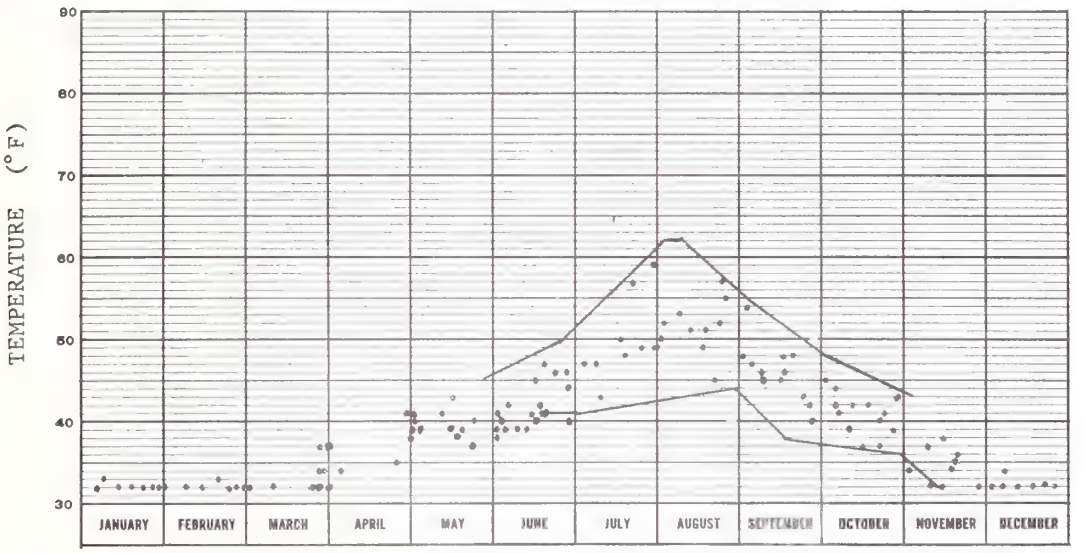
Drainage area.--71.3 sq mi.

Water temperature records available.--131 spot observations made at time of discharge measurements during periods April 1949 to October 1956, September 1959 to December 1965. Thermograph record on a seasonal basis during period May 1963 to November 1965 published in reports of the Geological Survey

Extremes.--Discharge 1948-56, 1959-65: Maximum, 5,020 cfs June 8, 1964; minimum daily, 10 cfs Nov. 26, 1952.

Water temperatures 1949-56, 1959-65: Maximum, 62°F Aug. 2, 10, 1965; minimum, freezing point on many days during winter months.

Cooperation.--Thermograph records furnished by Corps of Engineers.



Spot observations of water temperatures, 1949-56, 1959-65. The lines connect the highest and lowest monthly temperatures from seasonal thermograph record, 1963-65.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
28-53	1500	32	9-50	1430	32	2-50	1330	32	29-49	1200	41	4-50	1230	39	28-50	1030	46
29-55	1100	32	24-53	1630	32	31-54	1430	32	1-53	1230	37	1-52	1100	38	5-53	1600	42
7-56	1030	32	28-55	1200	32	2-56	1530	32	1-55	1500	32	22-52	1000	39	16-53	1500	45
15-60	1045	32	1-62	1030	32	30-56	1230	34	30-55	1300	41	15-53	1140	41	24-54	1500	46
19-61	0940	32	21-63	1130	33	2-60	1500	32	30-56	1330	38	1-54	1600	39	2-55	0930	38
30-61	1100	32	26-64	1700	32	11-60	1430	32	27-61	1200	35	19-54	1500	43	9-55	1200	39
29-63	1400	32	15-65	1520	32	30-60	1200	34	4-63	1400	34	25-60	1230	40	14-55	1000	41
24-64	1500	32				28-61	1530	37				2-62	1330	41	19-56	1030	47
9-65	1300	33				1-62	1500	32				23-62	1130	39	2-60	0930	39
						28-62	1200	34				2-63	1530	40	4-60	0725	39

259. Sullivan Creek near Hungry Horse, Mont. (12-3610)

Water temperatures at time of discharge measurements--Continued

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
						26-64	1730	32				15-64	1000	39	13-60	0815	39
						23-65	1515	32				23-64	0900	37	28-60	0820	40
												18-65	1030	38	15-61	1000	42
															13-62	1500	41
															3-63	1130	41
															28-63	0900	44
															5-64	1430	40
															16-64	0830	40
															4-65	1115	40
															19-65	1200	41
July			August			September			October			November			December		
3-52	1100	47	20-53	0845	51	5-51	1300	47	5-51	1130	44	2-49	1000	34	5-49	1600	32
30-52	1345	59	3-54	1300	52	3-52	1400	54	6-52	1600	41	3-52	1715	34	2-52	1400	32
21-53	1115	48	2-55	1130	50	22-53	1330	48	22-53	1300	37	12-53	1500	37	6-54	1330	34
7-55	1000	43	29-55	1400	55	8-54	0930	46	11-54	1300	42	16-54	1000	38	28-59	1400	32
23-56	1300	57	25-56	1130	52	19-55	1500	48	19-55	1430	42	15-55	1400	32	20-60	1200	32
27-60	0710	49	15-61	0900	51	29-59	1100	40	2-56	1230	45	18-60	1000	34	28-61	1200	32
20-62	1030	50	23-62	1000	45	2-60	0835	48	23-59	1300	40	13-61	1100	32	13-62	1030	32
31-63	1100	49	28-63	1430	57	27-60	1210	42	24-60	1000	41	20-62	1100	36	24-63	1230	32
6-64	1200	47	19-64	1100	49	18-61	1000	45	17-62	1100	37	29-63	1100	32	27-65	1220	32
			10-65	1200	53	19-62	1100	46	29-63	1100	39	19-64	0850	35			
						27-63	0830	43	7-64	1445	42						
						10-65	1230	45	11-65	1215	39						
									30-65	1525	43						

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	--	--	--	--	50	58	61	55	48	--	--
	Min	--	--	--	--	45	--	41	45	42	36	--	--
1964	Max	--	--	--	--	--	--	56	57	47	44	--	--
	Min	--	--	--	--	--	--	47	46	41	--	--	--
1965	Max	--	--	--	--	--	49	61	62	51	47	43	--
	Min	--	--	--	--	--	41	42	44	38	37	32	--
Extremes for years 1963-65													
	Max	--	--	--	--	45	50	61	62	55	48	43	--
	Min	--	--	--	--	--	41	41	44	38	36	32	--

260. Graves Creek near Hungry Horse, Mont. (12-3615)

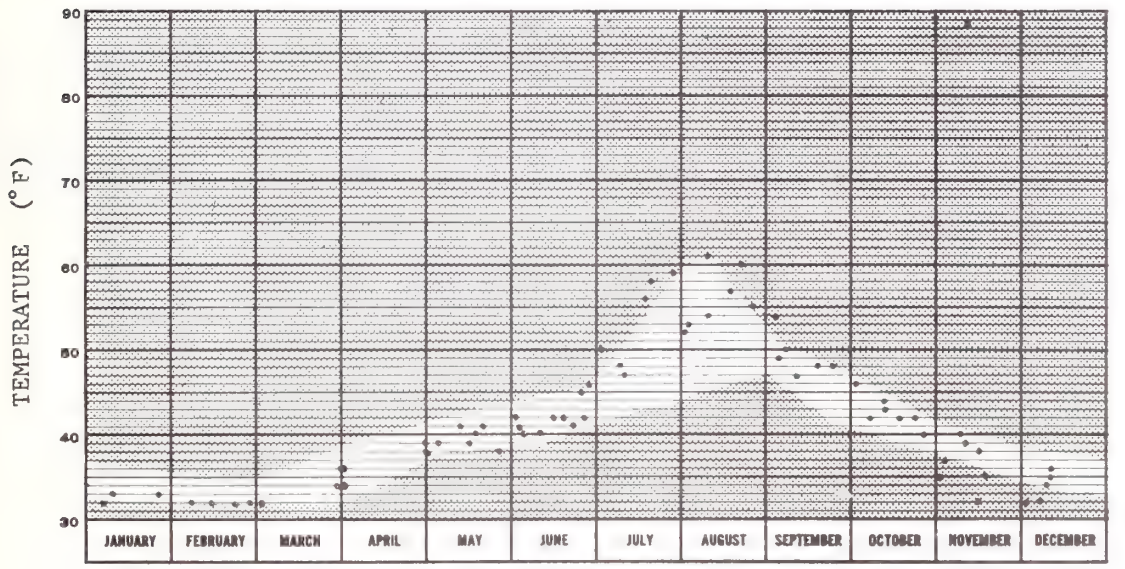
Location.--At gaging station, lat 48°07'50", long 113°48'35", in SE¼ sec.1, T.27 N., R.18 W., on left bank 500 ft upstream from Hungry Horse Reservoir flow line and 22 miles southeast of Hungry Horse. Altitude of gage is 3,600 ft (from topographic map).

Drainage area.--27.0 sq mi.

Water temperature records available.--67 spot observations made at time of discharge measurements during periods November 1949 to October 1956, October 1964 to December 1965. Thermograph record during period November 1964 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1948-56, 1964-65: Maximum, 3,780 cfs June 18, 1965; minimum daily, 4.5 cfs Nov. 26, 1952.

Water temperatures 1949-56, 1964-65: Maximum, 61°F Aug. 9-11, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-56, 1964-65. The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1964-65.

260. Graves Creek near Hungry Horse, Mont. (12-3615)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-55	1500	33	10-50	1100	32	3-50	0900	32	1-53	1130	36	4-50	1700	39	23-50	1200	45
6-56	1500	32	24-53	1430	32	2-56	1800	32	1-55	1700	34	21-52	1530	41	5-53	1030	40
9-65	0940	33	27-55	1630	32	30-56	1530	34	30-55	1630	39	14-53	1320	41	16-53	1000	42
			15-65	1220	32							1-54	1330	38	24-54	1000	42
												19-56	1330	40	2-55	1430	42
												28-56	0840	38	9-55	0900	40
												18-65	1315	39	14-55	1230	42
															26-56	1330	46
															4-65	1410	41
															19-65	0940	41
July			August			September			October			November			December		
2-52	1400	50	20-53	1040	57	5-51	1030	49	6-52	1030	42	2-49	1200	35	5-49	1130	32
29-52	1230	59	3-54	1030	53	3-52	1130	54	22-53	1100	40	3-52	1500	37	2-52	1115	32
21-53	1410	56	2-55	0900	52	22-53	1130	48	11-54	1100	44	12-53	1330	39	8-53	1330	35
11-55	1200	48	29-55	1200	55	7-54	1200	50	19-55	1130	42	15-54	1100	38	7-54	0930	34
23-56	1100	58	24-56	1430	60	19-55	1330	48	2-56	1000	46	15-55	1200	32	8-65	1115	36
12-65	1000	47	10-65	0920	54	10-65	1055	47	14-64	1350	42	18-64	1500	35			
									11-65	1405	43	10-65	1420	40			

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1964	Max	--	--	--	--	--	--	--	--	--	--	36	37
	Min	--	--	--	--	--	--	--	--	--	--	--	33
1965	Max	36	35	36	40	43	46	60	61	52	46	41	38
	Min	32	32	32	33	38	39	42	47	41	38	34	33

261. Canyon Creek near Hungry Horse, Mont. (12-3616)

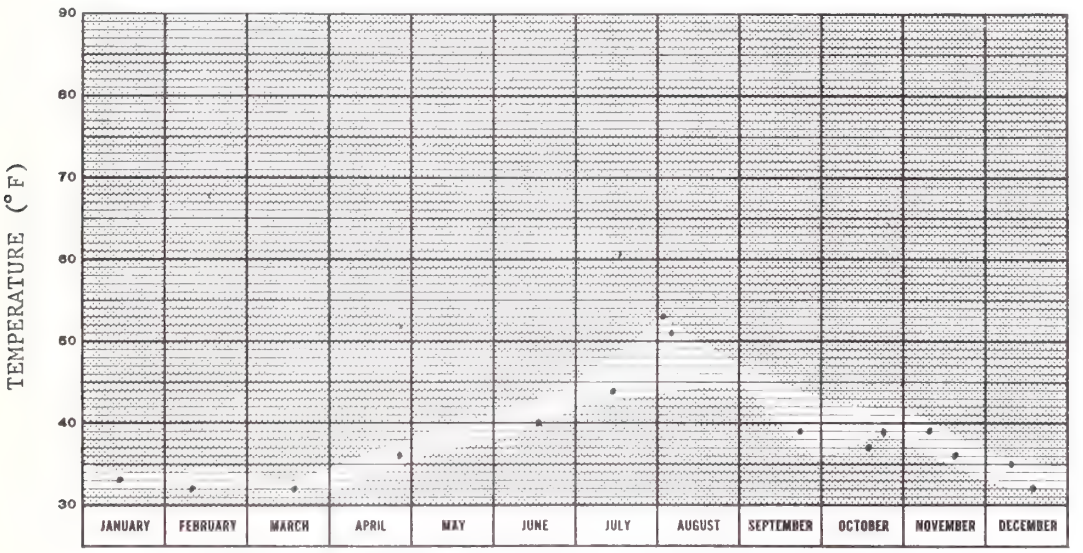
Location.--At gaging station, lat 48°12'50", long 113°45'40", in NW¼SE¼SW¼ sec.4, T.28 N., R.17 W., on right bank 50 ft downstream from bridge on east shore road, 400 ft upstream from Hungry Horse Reservoir flow line, and 18 miles southeast of Hungry Horse. Altitude of gage is 3,580 ft (from river-profile map).

Drainage area.--5.8 sq mi, approximately.

Water temperature records available.--14 spot observations made at time of discharge measurements. Thermograph record during period October 1964 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1964-65: Maximum, 140 cfs June 4, 1965; minimum, 1.6 cfs Dec. 15, 1964.

Water temperatures 1964-65: Maximum, 53°F Aug. 3, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1964-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1964-65.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
13-65	--	33	11-65	--	32	18-65	--	32	26-65	--	36				18-65	--	40
July			August			September			October			November			December		
13-65	--	44	6-65	--	51	23-65	1225	39	16-64	--	37	20-64	--	36	18-64	--	32
									23-65	0815	39	10-65	1300	39	10-65	1235	35

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1964	Max	--	--	--	--	--	--	--	--	--	--	42	36
	Min	--	--	--	--	--	--	--	--	--	--	33	32
1965	Max	34	34	33	38	41	44	52	53	47	42	41	35
	Min	32	32	32	32	36	38	42	45	36	39	33	33

262. Emery Creek near Hungry Horse, Mont. (12-3619.6)

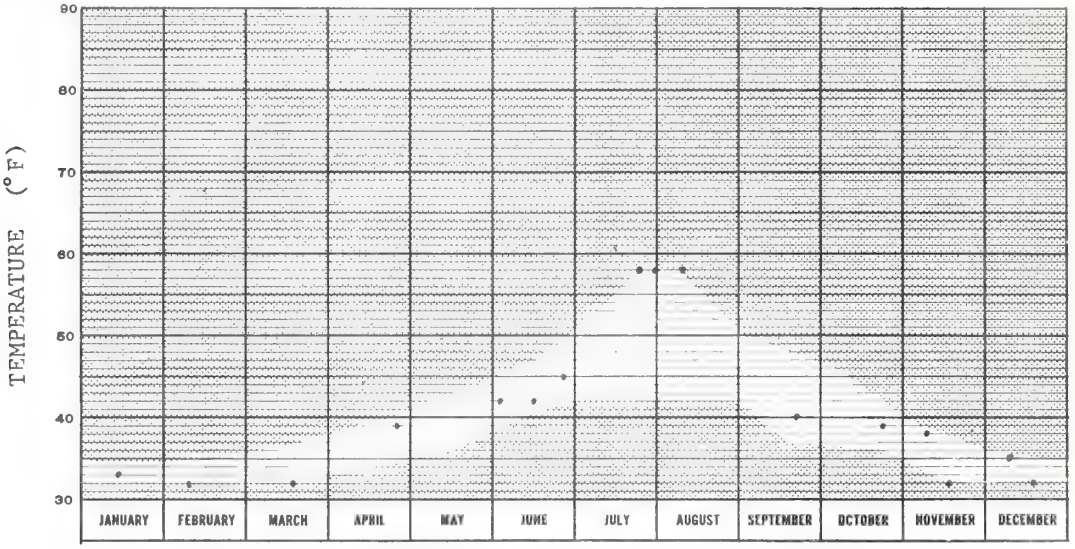
Location.--At gaging station, lat 48°21'30", long 113°55'35", in SE¼NE¼SW¼ sec.17, T.30 N., R.18 W., on left bank 1,000 ft upstream from bridge on east shore road, 900 ft upstream from Hungry Horse Reservoir flow line and 6 miles southeast of Hungry Horse. Altitude of gage is 3,600 ft (from topographic map).

Drainage area.--26.4 sq mi.

Water temperature records available.--14 spot observations made at time of discharge measurements. Thermograph record during period November 1964 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1964-65: Maximum, 832 cfs June 8, 1964; minimum daily, 7.0 cfs Dec. 17, 1964.

Water temperatures 1964-65: Maximum, 58°F July 28-30, Aug. 1, 2, 9, 1965; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1964-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1964-65.

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
13-65	--	33	11-65	--	32	18-65	--	32	27-65	--	39				3-65	--	42
															14-65	--	42
															25-65	--	45
July			August			September			October			November			December		
30-65	--	58				21-65	--	40	23-65	1150	39	16-64	--	32	18-64	--	32
												10-65	1505	38	10-65	1410	35

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1964	Max	--	--	--	--	--	--	--	--	--	--	39	35
	Min	--	--	--	--	--	--	--	--	--	--	32	32
1965	Max	34	35	36	40	44	48	58	58	50	46	40	36
	Min	32	32	32	33	36	39	42	42	37	36	33	32

263. Hungry Horse Reservoir near Hungry Horse, Mont. (12-3620)

Location.--In reservoir above dam located at lat 48°20'30", long 114°00'50", across line between secs. 22 and 27, T.30 N., R.19 W., 3 miles southeast of Hungry Horse and at mile 5.2. Datum of maximum operating surface of the reservoir is 3,560 ft above mean sea level.

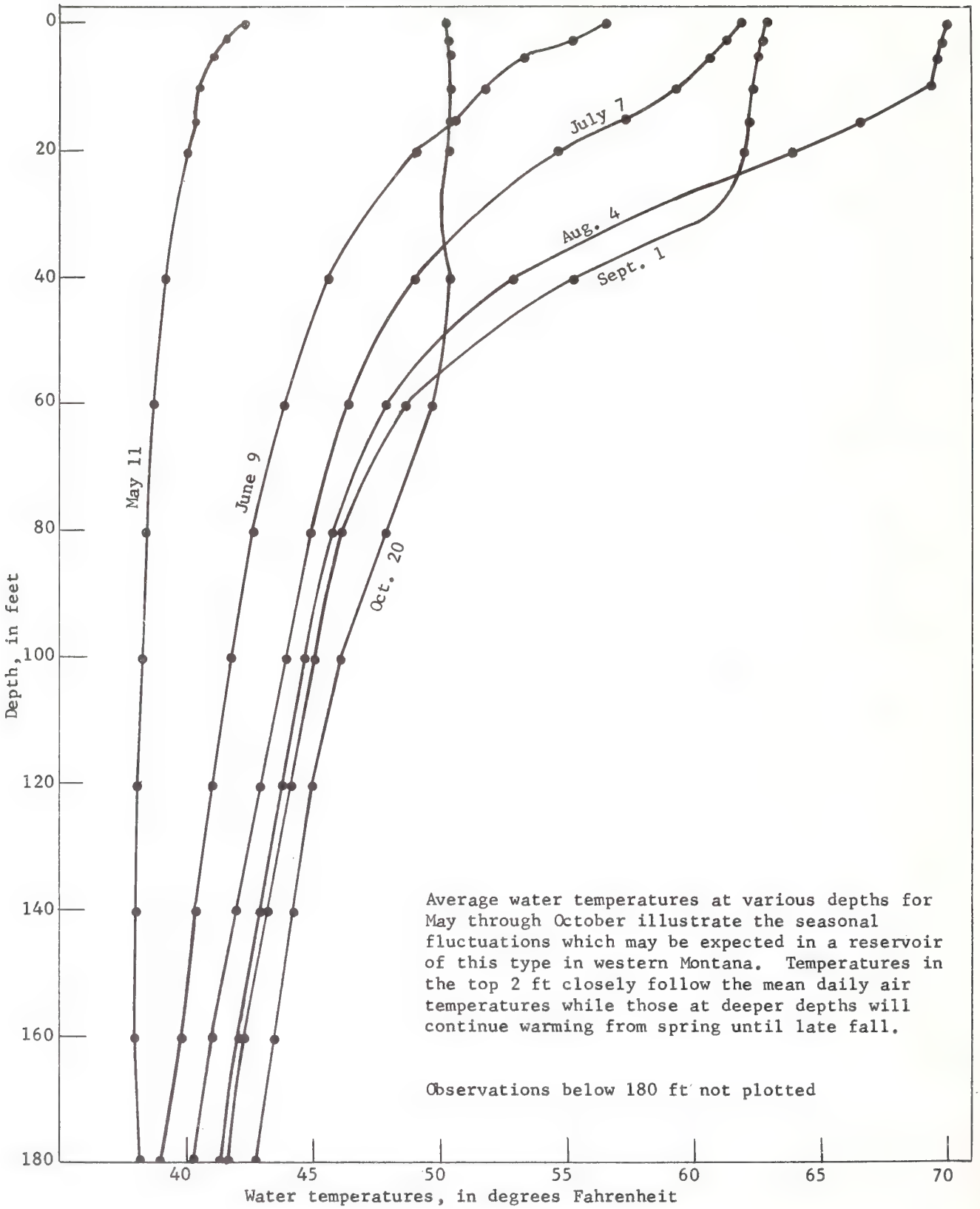
Drainage area.--1,654 sq mi.

Water temperature records available.--Temperature data were obtained by the Corps of Engineers in 1963-64 and the Geological Survey in 1965. This data consists of numerous temperature profiles and thermograph records of various locations throughout the reservoir. This data is available in files of the Helena District Office of the Geological Survey. Since operation of the reservoir began in 1951, the Bureau of Reclamation has collected hourly temperatures of water in the tailrace and also at the scroll-case, which would approximate reservoir temperatures at the penstock at elevation 3,319 ft.

Temperatures on selected days plotted here were obtained by averaging observed temperatures at each depth for 10 to 23 profile stations evenly spaced along the 33-mile axis of the reservoir.

Average reservoir elevation on days for which average profiles are plotted

Date	Elevation (in feet)
May 11, 1965	3,466.80
June 9, 1965	3,520.20
July 7, 1965	3,558.70
Aug. 4, 1965	3,560.50
Sept. 1, 1965	3,560.50
Oct. 20, 1965	3,560.15



Water Temperatures In Hungry Horse Reservoir For 1965

264. South Fork Flathead River near Columbia Falls, Mont. (12-3625)

Location.--At gaging station, lat 48°21'30", long 114°02'15", in SW¼SE¼SW¼ sec.16, T.30 N., R.19 W., on right bank 1½ miles downstream from Hungry Horse Dam, 3½ miles upstream from mouth, and 7 miles east of Columbia Falls. Datum of gage is 3,040.0 ft above mean sea level (levels by Bureau of Reclamation).

Drainage area.--1,663 sq mi.

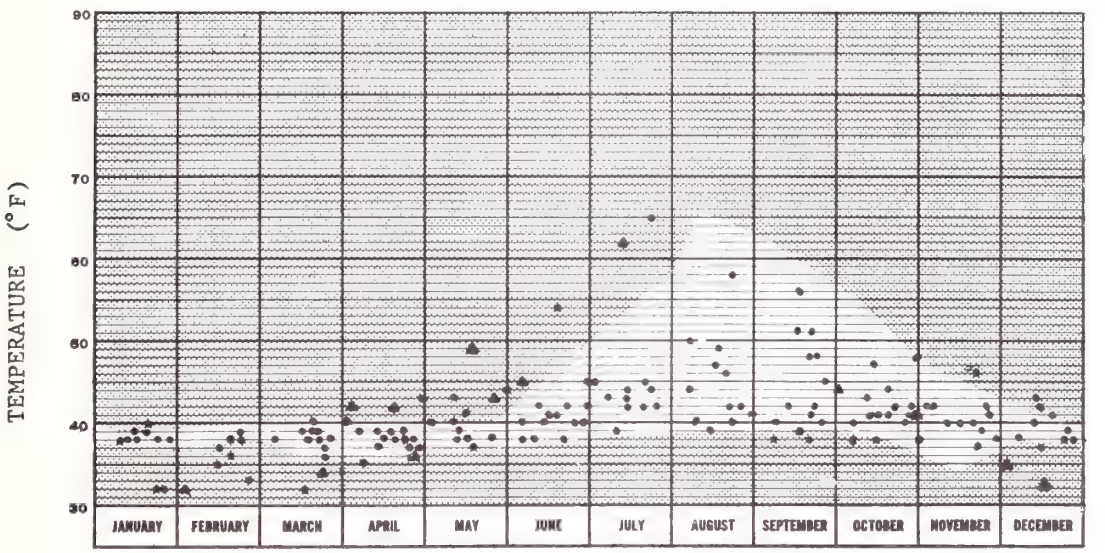
Water temperature records available.--167 spot observations made at time of discharge measurements during period December 1948 to December 1965. Thermograph record during period January 1963 to September 1964 published in this report. Thermograph record during period October 1964 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1910-16, 1923-65: Maximum observed, 46,200 cfs June 19, 1916; minimum observed, 7.3 cfs Sept. 24, 1951 (dam closure).

Water temperatures 1948-65: Maximum, 66°F Aug. 11, 1963; minimum observed, 32°F mostly at times prior to 1951.

Remarks.--Water temperatures affected by storage in Hungry Horse Reservoir since Sept. 21, 1951. Water to operate powerplant is drawn from bottom third of reservoir and spillway water comes from the top of the pond.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



Spot observations of water temperatures, 1948-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1963-65.

▲ Before dam closure, Sept. 21, 1951.
• After dam closure.

264. South Fork Flathead River near Columbia Falls, Mont. (12-3625)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
24-52	1300	32	4-50	1230	32	25-50	1000	34	4-49	--	42	16-49	--	49	6-50	1115	45
20-53	1330	40	26-52	1530	33	19-52	1700	32	28-50	1430	36	27-50	1130	43	30-52	1330	45
17-55	1400	38	20-53	1200	36	31-52	1530	34	17-51	1600	42	13-52	1630	43	19-53	1030	41
26-56	1500	32	23-54	1400	39	24-54	1430	39	9-52	1600	35	31-52	1230	44	30-53	1030	42
16-58	1130	38	16-55	1230	35	26-54	1030	36	30-52	1500	43	12-53	1030	40	5-54	0930	38
30-59	1500	38	23-56	1530	38	20-56	1430	38	7-53	1700	39	28-54	1030	43	22-55	1030	42
13-60	1500	38	20-58	1230	38	26-57	1430	36	12-54	1530	39	18-56	2000	37	8-56	1530	38
15-60	1300	39	24-61	1030	38	24-59	1530	38	16-54	1400	39	2-57	1400	40	24-57	0800	40
20-61	1430	39	20-62	1400	38	7-60	1400	38	19-54	1300	39	15-57	1200	41	11-58	1000	42
25-62	1200	38	17-64	1200	37	18-60	1030	39	20-55	1100	38	13-58	1300	38	21-60	1100	38
24-63	1600	38				22-60	1000	40	17-58	1500	38	27-60	1230	38	14-61	0900	40
17-64	1100	38				27-61	1030	38	24-59	1600	37	16-61	1200	38	7-62	1300	40
11-65	1400	38				16-62	1430	39	14-60	1100	38	13-63	1400	39	17-63	1330	54
						24-64	1630	37	18-61	1000	38	26-64	1430	38	29-64	1100	40
						8-65	1430	38	26-62	1600	38	14-65	1610	38	16-65	1345	41
									1-63	1530	40						
									27-64	1100	37						
									14-65	1000	37						
July			August			September			October			November			December		
13-49	1130	62	19-52	1600	46	25-51	1300	48	2-49	1730	44	1-51	1330	38	16-48	--	32
2-52	1030	45	26-53	1030	42	23-52	1300	51	29-49	1300	41	29-51	1500	38	3-49	1100	35
22-52	0940	45	26-53	1130	42	29-52	1600	45	19-51	1300	44	20-52	1620	46	16-52	1600	43
14-53	1150	43	10-54	1330	40	14-53	1045	42	14-52	1650	47	3-53	1600	42	17-53	1600	42
14-53	1230	44	11-55	0730	40	14-53	1200	42	31-52	1200	48	18-54	1000	40	15-54	1430	40
8-55	1000	43	7-57	0800	50	9-55	1330	38	12-53	1130	41	12-57	1530	40	28-56	1300	38
26-56	1500	65	15-58	1730	39	27-55	0930	40	30-53	1700	42	25-58	1620	42	10-57	1500	38
24-59	1200	44	21-59	1400	42	21-56	1500	38	7-54	1430	40	25-60	1430	41	27-60	1430	39
27-60	1300	42	31-60	1500	41	9-57	1500	40	7-57	1600	38	15-61	1600	40	26-61	1100	38
20-61	0930	42	16-61	0900	47	17-58	1500	39	14-58	1200	38	21-62	1130	39	17-63	1130	37
12-62	1430	39	20-62	0905	58	22-59	1400	42	22-59	1230	42	20-63	1100	37	20-65	1500	41
15-63	1230	42	21-63	1000	40	23-60	1500	48	14-60	1030	41	5-65	1510	42			
22-65	1425	42	7-64	1530	44	20-61	1130	41	18-61	1500	41						
			17-65	1530	49	17-62	1300	51	12-62	0930	43						
						18-63	0825	56	27-64	1245	40						
									29-65	1330	41						

PEND OREILLE RIVER BASIN

264. South Fork Flathead River near Columbia Falls, Mont. (12-3625)

Water temperatures (°F), January to December 1963

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	38	38	38	38	38	38	38	39	-
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	38	38	38	38	38	38	38	38	-
February																																
Maximum.....	39	39	39	39	39	39	39	39	39	39	39	38	38	38	38	38	39	39	39	39	39	39	39	39	39	39	39	40	-	-	-	39
Minimum.....	38	39	39	39	39	39	39	39	39	39	38	38	38	38	38	38	39	39	39	38	38	38	38	38	38	38	38	39	-	-	-	38
March																																
Maximum.....	40	40	39	40	40	40	39	39	40	40	40	40	40	40	40	40	41	40	40	41	41	41	40	40	41	41	40	40	39	39	40	40
Minimum.....	39	38	38	38	39	38	38	38	38	39	39	38	39	38	39	39	39	39	39	39	39	39	39	39	39	39	39	39	38	38	39	39
April																																
Maximum.....	39	39	39	39	39	39	39	39	39	38	38	38	38	38	38	39	38	38	38	38	38	38	38	38	38	38	39	39	39	39	-	38
Minimum.....	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	39	39	39	39	-	38
May																																
Maximum.....	39	39	39	39	39	39	39	39	38	38	38	39	38	39	39	38	39	38	39	39	39	39	39	38	38	39	39	39	39	39	39	39
Minimum.....	39	39	39	39	39	39	38	38	38	38	38	38	38	38	36	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
June																																
Maximum.....	39	39	40	41	41	42	41	43	42	43	43	45	45	46	45	45	46	46	45	45	43	41	43	43	43	45	42	39	40	40	-	43
Minimum.....	38	38	38	38	38	38	38	40	40	40	40	41	41	41	41	42	41	42	42	41	41	40	40	40	41	40	38	38	38	39	-	41
July																																
Maximum.....	39	39	40	40	40	39	40	40	40	40	40	40	40	40	40	41	41	42	42	42	42	41	41	44	43	48	44	42	42	45	45	41
Minimum.....	39	39	39	39	39	39	39	39	39	40	40	40	40	40	40	40	40	41	40	41	41	40	40	40	42	43	42	41	41	41	42	40
August																																
Maximum.....	44	45	45	46	46	46	47	48	49	62	66	65	48	47	45	46	46	46	58	61	57	53	53	59	63	61	62	62	60	47	60	53
Minimum.....	43	43	43	44	44	44	39	45	44	48	62	46	46	41	41	44	44	44	39	40	39	42	46	53	40	40	59	60	47	41	47	45
September																																
Maximum.....	60	47	61	60	58	62	62	60	61	60	61	60	60	59	56	58	57	57	57	56	57	59	59	58	57	46	47	47	48	49	-	57
Minimum.....	47	40	46	47	41	41	41	42	41	40	40	41	41	40	40	41	40	41	41	41	41	57	40	40	39	39	45	46	46	47	-	42
October																																
Maximum.....	50	53	52	52	54	55	56	55	55	54	54	54	55	55	54	53	53	39	39	39	39	40	39	39	40	40	39	40	39	40	39	47
Minimum.....	47	50	40	50	51	54	54	40	53	51	40	40	54	54	40	41	39	38	38	38	38	39	38	39	39	39	39	39	39	39	39	44
November																																
Maximum.....	40	40	40	40	40	39	40	40	40	40	40	39	40	40	40	39	39	39	39	39	39	39	40	40	40	40	40	39	39	39	-	40
Minimum.....	39	39	38	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	37	38	39	39	39	40	40	39	38	38	39	-	39
December																																
Maximum.....	39	39	39	39	39	40	39	39	39	40	40	40	40	40	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
Minimum.....	38	38	39	39	39	39	39	38	38	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39

PEND OREILLE RIVER BASIN

264. South Fork Flathead River near Columbia Falls, Mont. (12-3625)

Water temperatures (°F), January to September 1964

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	39	39	39	39	39	39	39	39	38	38	38	38	38	38	38	38	38	37	37	37	37	37	37	38	37	37	37	38	37	37	37	38
Minimum.....	39	39	39	39	39	39	39	38	38	38	38	38	38	38	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	38
February																																
Maximum.....	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	-	-	38
Minimum.....	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	-	-	38
March																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	38	38	39	38	39	39	39	38	38	38	38	38	39	39	40	40	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	38	38	38	38	38	38	37	37	37	37	38	38	38	38	38	38	--
April																																
Maximum.....	39	39	40	40	39	40	40	38	38	38	38	38	38	38	37	37	37	37	37	37	37	37	38	39	38	39	38	38	37	37	-	38
Minimum.....	38	38	38	38	38	38	38	38	38	38	38	38	38	37	37	37	37	37	37	37	37	37	37	37	38	38	37	37	37	37	-	38
May																																
Maximum.....	37	37	37	37	37	37	37	38	38	38	38	39	39	39	39	39	38	39	38	38	38	39	38	38	38	38	38	38	37	38	38	38
Minimum.....	37	37	37	37	37	37	37	37	37	38	38	38	38	38	38	38	38	38	38	38	38	38	38	37	37	38	37	37	37	37	37	37
June																																
Maximum.....	38	38	39	38	38	37	37	37	40	40	40	40	40	41	40	40	40	40	41	41	41	41	40	41	41	41	40	40	40	40	-	40
Minimum.....	37	37	37	37	37	37	37	37	37	37	39	39	39	40	40	40	40	39	39	41	41	40	40	40	40	40	40	40	39	39	39	-	39
July																																
Maximum.....	40	40	41	41	41	41	41	40	40	40	40	40	42	42	42	41	40	40	42	--	--	--	--	43	43	43	43	48	44	58	57	43
Minimum.....	39	38	39	40	40	40	40	39	39	39	39	39	40	40	40	40	40	40	40	--	--	--	--	41	42	42	42	42	40	40	41	40
August																																
Maximum.....	60	44	44	44	44	44	58	58	58	60	58	43	60	58	58	58	60	60	58	58	58	59	58	58	59	59	58	56	57	56	56	55
Minimum.....	43	43	43	42	42	42	42	43	42	42	43	40	42	42	43	43	43	42	42	43	43	43	42	43	43	41	41	40	42	42	42	42
September																																
Maximum.....	56	56	54	54	53	53	54	53	53	52	51	53	53	53	53	53	53	53	54	43	51	52	52	53	53	51	52	52	51	54	-	53
Minimum.....	42	41	41	41	42	42	42	42	41	42	40	51	42	42	41	41	41	52	43	42	42	41	42	41	42	42	42	42	42	42	-	42

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	--	40	41	39	39	46	48	66	62	56	40	40
	Min	38	38	38	38	38	38	39	39	39	38	38	38
1964	Max	39	38	40	40	39	41	58	60	56	51	47	41
	Min	37	38	37	37	37	37	38	40	40	41	34	39
1965	Max	39	39	38	38	40	46	47	52	48	47	42	42
	Min	38	38	36	36	37	38	39	40	40	39	39	40

Extremes for years 1963-65

Max	39	40	41	40	40	46	58	66	62	56	47	42
Min	37	38	36	36	37	37	38	39	39	38	34	38

265. Flathead River at Columbia Falls, Mont. (12-3630)

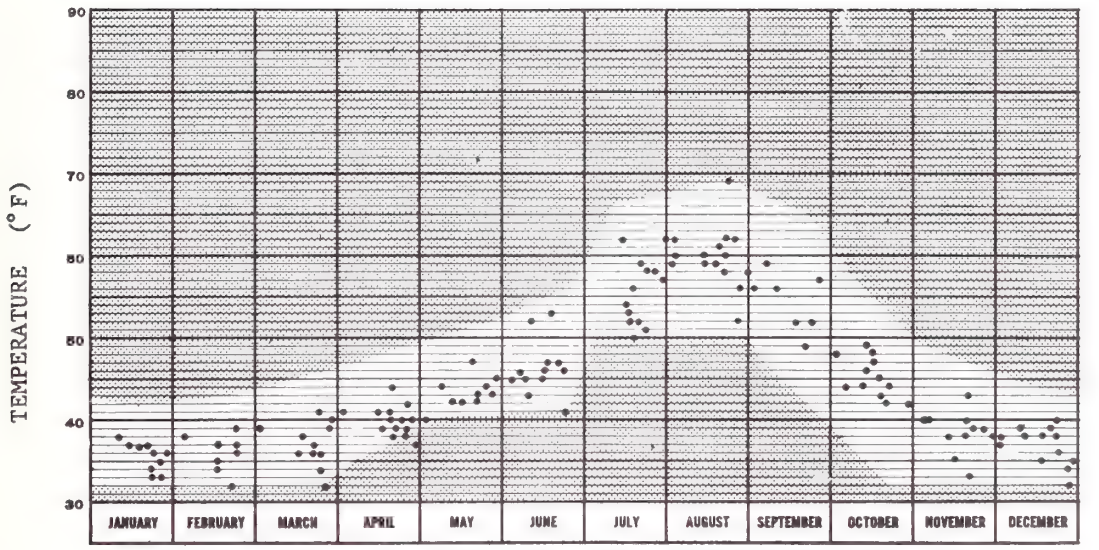
Location.--At gaging station, lat 48°21'50", long 114°11'10", in NW¼SE¼ sec.17, T.30 N., R.20 W., on right bank 200 ft downstream from county road bridge at Columbia Falls, 5.7 miles downstream from South Fork, and at mile 143.0. Datum of gage is 2,977.67 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Corps of Engineers).

Drainage area.--4,464 sq mi.

Water temperature records available.--150 spot observations made at time of discharge measurements during period April 1949 to December 1965. Once-daily observations made during period January 1949 to September 1950, August 1963 to December 1965 published in reports of the Geological Survey.

Extremes.--Discharge 1922-23, 1928-65: Maximum, 176,000 cfs June 9, 1964; minimum, 798 cfs Dec. 8, 1929.

Water temperatures 1949-65: Maximum, 69°F Aug. 23, 1963; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from once-daily observations, 1949-50, 1963-65.

265. Flathead River at Columbia Falls, Mont. (12-3630)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
20-53	1700	37	16-53	1600	35	23-50	1600	36	26-49	1530	42	24-50	1030	44	7-49	1130	46
27-54	1630	35	23-54	1100	39	24-53	1600	41	29-50	1600	37	9-52	1600	44	2-50	1100	44
13-55	1100	37	16-55	1430	34	18-54	1100	38	16-52	1030	39	21-53	1630	43	3-53	1730	45
24-56	1200	36	23-56	1230	36	17-55	1330	36	22-53	1500	44	17-54	1600	42	19-53	1500	47
10-57	1530	38	15-57	1430	34	22-56	1200	37	20-54	1100	38	2-57	1600	40	8-56	1200	45
28-58	1200	33	21-58	1200	32	26-57	1200	34	20-55	1400	40	13-58	1530	42	14-57	1200	46
29-59	1600	36	24-59	1600	36	25-59	1600	36	27-56	1130	38	27-60	1500	43	11-58	1200	52
24-61	1030	33	24-61	1330	37	27-61	1330	39	23-58	1530	40	19-61	1500	47	22-59	1600	46
23-63	1100	34	25-63	1500	37	28-62	1530	40	27-59	1600	39	29-61	0830	45	7-60	1305	45
17-64	1500	37	17-64	1530	37	17-64	1430	36	14-60	1430	41	21-64	1630	42	21-60	1500	41
			4-65	1400	38	25-64	1000	32	18-61	1330	41				14-61	1200	45
						2-65	1530	39	19-62	1530	40				14-62	1530	45
									2-63	1400	41				17-63	1400	53
									27-64	1430	40				10-64	1100	43
									21-65	1530	39				16-65	1150	47
July			August			September			October			November			December		
13-49	1500	62	13-53	1300	59	2-52	1230	56	15-52	1330	47	4-49	1200	40	1-49	1630	37
31-52	1350	62	27-54	1515	52	25-52	1530	57	31-52	1115	42	16-51	0845	35	22-52	1100	40
17-53	1300	56	2-56	1600	62	10-53	1200	56	12-53	1500	49	20-52	0950	43	22-53	1100	38
30-54	1230	57	31-56	1430	58	2-55	1330	56	22-54	1130	44	19-53	1600	40	16-54	1330	38
14-55	1500	54	20-57	1500	62	5-58	1210	59	6-55	1500	44	18-54	1300	40	28-55	1030	32
18-57	1400	59	25-58	0930	62	22-59	1630	52	1-56	1530	48	6-56	1500	40	11-57	1500	38
16-58	1000	52	27-59	1300	56	20-61	1400	49	14-58	1600	48	30-56	1400	38	2-58	1530	38
24-59	1600	58	3-61	1000	59	17-62	1100	52	22-59	1500	42	13-57	1600	39	28-60	1430	34
27-60	1430	58	4-61	1230	60	18-63	1330	52	13-60	1000	46	17-60	1230	35	26-61	1630	36
20-61	1230	58	16-61	1130	59	24-65	1510	57	19-61	1500	45	20-61	1530	33	12-62	1500	39
18-62	1500	52	20-62	0945	58				12-62	1200	44	21-62	1400	39	17-63	1530	35
15-63	1330	53	20-63	1300	60				20-64	1450	43	18-63	1500	38	30-64	1530	35
14-64	1100	54	18-64	1500	61							24-64	1600	39	20-65	1430	39
16-64	1000	50	13-65	1500	60												
22-65	1100	51															

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1949	Max	41	41	--	48	52	56	66	68	65	48	40	38
	Min	32	33	35	38	41	48	57	55	48	32	34	32
1950	Max	32	32	35	41	47	51	61	63	65	--	--	--
	Min	32	32	32	34	40	45	50	60	45	--	--	--
1963	Max	--	--	--	--	--	--	--	69	65	57	49	42
	Min	--	--	--	--	--	--	--	57	45	40	35	33
1964	Max	41	40	46	46	51	56	60	65	57	49	48	44
	Min	36	37	32	39	41	41	51	53	50	41	37	34
1965	Max	42	43	41	44	50	53	64	67	58	55	45	45
	Min	36	32	34	38	41	46	51	50	44	44	32	38

Extremes for years 1949-50, 1963-65

Max	42	43	46	48	52	56	66	69	65	57	49	45
Min	32	32	32	34	40	41	50	50	44	32	32	32

266. Flathead River at Holt Bridge, near Bigfork, Mont. (12-3690.1)

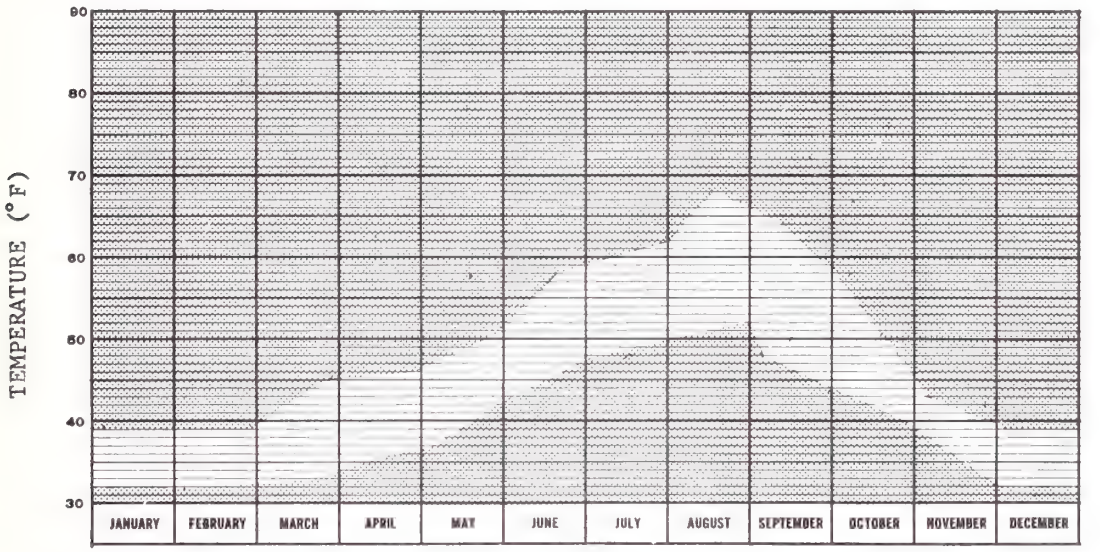
Location.--At thermograph site, lat 48°05'03", long 114°06'40", in SW¼SW¼ sec.23, T.27 N., R.20 W., in center of county bridge at Holt, half a mile downstream from former gage site at Keller Ranch, 2½ miles northwest of Bigfork, and at mile 106. Altitude of thermograph is about 2,880 ft (from topographic map).

Water temperatures records available.--Thermograph record during period January 1963 to December 1965 published in this report.

Extremes.--Water temperatures 1963-65: Maximum, 68°F Aug. 14, 1963; minimum, freezing point on many days during winter months.

Remarks.--Thermograph is 10 ft below water surface.

Cooperation.--Thermograph record furnished by Montana Fish and Game Department.



The unshaded area delineates the range between the highest and lowest monthly temperatures from thermograph record, 1963-65.

Summary of thermograph record

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1963	Max	39	39	45	46	51	58	62	68	64	58	42	37
	Min	32	32	36	38	40	47	48	59	54	41	33	33
1964	Max	38	37	44	45	48	--	60	61	51	48	43	37
	Min	35	35	34	37	37	45	52	52	48	40	34	32
1965	Max	37	38	39	45	48	51	62	64	55	47	41	39
	Min	32	33	33	36	38	43	48	53	41	40	32	34
Extremes for years 1963-65													
	Max	39	39	45	46	51	58	62	68	64	58	43	39
	Min	32	32	33	36	37	43	48	52	48	40	32	32

266. Flathead River at Holt Bridge, near Bigfork, Mont. (12-3690.1)
Water temperatures (°F), calendar year 1963

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	--	--	--	39	39	38	38	38	38	36	34	32	32	34	35	35	36	36	35	33	33	33	33	33	32	32	32	32	32	32	32	34
Minimum.....	--	--	--	39	36	38	38	38	36	34	32	32	32	32	34	35	35	35	33	33	33	33	33	32	32	32	32	32	32	32	32	34
February																																
Maximum.....	32	32	32	33	36	37	37	36	36	35	35	34	35	35	35	35	35	35	35	36	36	36	37	38	38	39	38	39	-	-	-	36
Minimum.....	32	32	32	32	33	36	36	36	35	35	34	34	34	34	35	34	35	35	35	35	35	35	36	37	38	38	38	38	-	-	-	35
March																																
Maximum.....	38	38	39	38	37	38	38	37	37	37	37	38	37	37	38	39	40	39	39	39	41	43	43	43	43	43	44	45	42	43	43	40
Minimum.....	37	37	38	37	37	37	37	36	36	36	37	37	36	36	37	38	39	39	38	38	39	40	41	41	41	41	43	44	42	43	41	39
April																																
Maximum.....	42	41	40	41	42	43	43	43	42	43	43	43	43	44	44	43	40	40	40	41	42	42	40	42	44	45	46	46	45	45	-	43
Minimum.....	41	38	39	40	40	42	42	42	40	40	40	40	40	40	41	42	39	39	39	39	39	39	39	40	40	41	43	44	44	44	-	41
May																																
Maximum.....	44	43	42	42	43	46	45	45	43	43	44	46	45	47	48	48	48	49	48	48	49	49	49	49	48	48	49	48	50	51	51	47
Minimum.....	43	41	40	40	41	42	44	43	42	42	42	43	43	44	45	46	46	47	46	45	47	48	48	48	46	46	47	48	48	49	47	45
June																																
Maximum.....	48	49	50	50	51	50	49	50	50	51	52	51	52	53	55	57	57	58	58	58	57	55	52	52	53	54	54	55	55	53	-	53
Minimum.....	47	47	48	48	49	47	47	48	48	49	50	50	50	50	52	54	55	55	55	56	55	52	49	48	51	53	52	54	53	49	-	51
July																																
Maximum.....	49	52	54	55	57	57	57	59	58	57	56	54	54	54	56	57	56	56	57	58	60	60	60	61	60	59	60	59	60	62	62	57
Minimum.....	48	48	51	53	54	55	55	55	57	55	54	53	52	54	54	56	55	54	55	56	57	58	58	59	57	57	58	58	58	60	60	55
August																																
Maximum.....	61	62	62	62	62	63	63	65	65	66	66	67	66	68	67	67	67	67	67	65	64	63	64	63	64	63	61	61	62	64	64	64
Minimum.....	59	59	60	61	61	62	62	63	64	64	63	64	64	65	66	66	66	66	65	64	62	62	62	61	61	61	60	60	60	61	62	62
September																																
Maximum.....	63	61	62	62	63	62	63	62	62	62	63	64	62	61	60	59	59	59	59	58	57	56	56	55	56	56	57	57	57	58	-	60
Minimum.....	62	61	61	61	61	61	61	61	61	62	61	61	61	60	59	59	58	58	57	55	54	54	54	54	54	55	55	56	56	56	-	58
October																																
Maximum.....	58	56	57	56	55	55	55	55	54	54	54	53	54	54	54	53	51	51	51	51	45	43	43	43	43	43	43	43	43	43	43	50
Minimum.....	55	55	55	56	55	55	55	54	54	53	53	53	52	52	52	51	51	51	50	45	43	41	42	42	43	43	42	43	43	43	42	49
November																																
Maximum.....	42	42	42	41	41	40	40	40	40	40	40	39	39	39	39	39	39	38	38	38	37	37	37	37	37	37	37	37	35	34	-	39
Minimum.....	42	41	41	41	40	40	40	40	40	40	39	39	39	39	39	39	38	38	38	37	37	36	36	37	37	37	37	36	33	33	-	38
December																																
Maximum.....	35	35	36	36	33	34	35	35	35	34	33	34	36	36	36	36	35	34	35	36	37	37	37	37	38	37	37	37	37	37	37	36
Minimum.....	34	35	35	32	32	33	34	35	34	33	32	32	34	36	36	35	34	33	33	35	36	37	37	37	37	37	37	37	37	36	36	35

PEND OREILLE RIVER BASIN

266. Flathead River at Holt Bridge, near Bigfork, Mont. (12-3690.1)

Water temperatures (°F), calendar year 1964

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	37	38	38	37	36	37	36	36	36	35	36	37	36	36	36	36	36	36	35	36	35	35	35	35	35	36	36	36	36	36	37	36
Minimum.....	37	37	37	36	36	36	36	36	35	35	35	36	36	36	36	36	36	35	35	35	35	35	35	35	35	35	35	35	35	36	36	36
February																																
Maximum.....	37	37	37	36	37	37	37	37	36	36	37	36	36	36	36	36	35	35	35	35	36	37	36	36	36	35	36	36	35	-	-	36
Minimum.....	36	37	36	36	36	36	36	36	36	36	36	36	36	36	36	35	35	35	35	35	35	36	35	36	35	35	35	35	35	-	-	36
March																																
Maximum.....	36	37	36	36	36	36	36	36	36	37	37	38	38	38	38	38	38	39	38	40	40	39	39	37	36	35	37	36	38	40	44	38
Minimum.....	35	36	35	35	35	36	35	35	34	35	36	36	37	36	36	37	37	38	37	38	39	39	37	36	32	32	35	35	36	38	39	36
April																																
Maximum.....	41	41	43	44	45	45	45	44	44	43	42	41	40	40	40	41	40	40	40	42	43	42	41	41	42	43	43	43	43	43	-	42
Minimum.....	40	40	40	42	42	43	42	43	42	41	40	39	38	38	38	39	37	37	39	40	41	41	40	40	40	41	42	41	40	41	-	40
May																																
Maximum.....	44	43	40	39	39	39	40	42	44	44	43	43	44	45	44	45	46	46	45	45	45	44	42	43	44	45	46	48	46	44	45	44
Minimum.....	43	40	37	37	39	39	39	40	42	43	42	42	42	43	43	43	45	44	44	44	44	41	41	42	43	43	44	46	44	44	44	42
June																																
Maximum.....	46	46	47	47	45	46	46	45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	45	45	46	45	44	45	45	44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
July																																
Maximum.....	--	--	--	--	--	--	--	--	56	56	55	56	56	57	56	56	54	54	56	56	57	--	--	59	59	59	59	60	60	60	60	--
Minimum.....	--	--	--	--	--	--	--	--	54	53	52	52	53	54	54	54	52	52	54	55	55	--	--	57	56	56	56	57	58	58	58	--
August																																
Maximum.....	58	56	57	57	57	58	59	60	59	59	60	60	58	59	60	59	59	60	59	59	60	61	61	59	58	58	57	57	56	55	53	58
Minimum.....	53	53	54	56	55	56	57	58	58	58	59	58	57	57	59	58	57	58	58	58	58	59	59	57	58	58	57	56	55	53	52	57
September																																
Maximum.....	51	50	50	50	50	49	51	52	52	51	51	50	50	49	50	50	50	51	51	52	51	51	50	51	50	49	50	49	50	49	-	50
Minimum.....	50	50	50	50	48	48	49	51	51	50	50	50	49	49	49	49	49	51	51	51	50	50	50	50	49	48	48	48	49	48	-	50
October																																
Maximum.....	47	47	48	48	46	45	45	45	45	46	46	46	46	46	46	45	45	45	44	43	42	42	42	42	42	42	42	41	41	41	41	44
Minimum.....	47	47	47	46	44	44	44	44	44	45	45	45	46	46	45	44	45	44	42	42	41	41	41	41	41	42	41	40	40	41	41	43
November																																
Maximum.....	41	42	42	43	43	43	42	41	41	41	39	39	39	39	38	38	37	36	35	35	36	36	36	37	37	38	38	38	36	35	-	39
Minimum.....	40	41	42	42	43	42	41	40	40	39	39	38	38	38	38	37	36	35	35	35	35	36	36	36	36	37	38	36	35	34	-	38
December																																
Maximum.....	35	35	36	37	37	37	37	36	36	36	36	37	36	35	34	32	32	32	33	34	35	35	35	36	35	33	33	34	34	34	34	35
Minimum.....	34	34	34	36	37	37	36	36	35	36	36	36	35	34	32	32	32	32	32	33	34	35	35	35	33	33	33	33	34	34	34	34

PEND OREILLE RIVER BASIN

266. Flathead River at Holt Bridge, near Bigfork, Mont. (12-3690.1)
Water temperatures (°F), calendar year 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	33	32	32	32	33	34	35	35	35	35	35	35	36	36	37	37	37	37	36	36	36	36	36	36	35	35	35	36	36	36	36	35
Minimum.....	32	32	32	32	32	33	34	34	34	34	35	35	35	36	36	37	37	37	36	36	36	36	36	35	35	35	35	35	35	36	36	35
February																																
Maximum.....	36	36	35	35	36	37	36	36	37	36	36	35	36	36	35	35	37	38	37	37	37	36	34	35	37	37	37	38	-	-	-	36
Minimum.....	36	35	35	35	35	36	36	36	36	36	35	34	35	35	35	34	35	37	36	36	36	34	33	33	35	36	36	37	-	-	-	35
March																																
Maximum.....	37	37	38	38	39	38	38	38	39	38	38	38	38	38	34	35	35	36	37	36	35	36	36	35	35	35	36	37	37	39	39	37
Minimum.....	35	35	36	36	36	36	36	37	37	36	36	37	36	33	33	33	33	34	35	34	34	33	33	33	33	33	35	36	37	37	39	35
April																																
Maximum.....	39	39	38	39	39	39	39	40	39	39	40	41	43	44	45	43	41	38	39	39	40	39	41	41	40	41	41	41	41	41	-	40
Minimum.....	39	37	37	37	37	38	38	38	38	39	38	40	41	43	43	41	36	37	37	38	38	38	39	39	39	40	40	40	40	40	-	39
May																																
Maximum.....	40	40	40	41	41	41	42	44	45	47	47	47	46	44	44	44	42	42	43	44	44	44	44	45	45	45	45	48	48	45	43	44
Minimum.....	39	38	39	40	39	40	40	40	41	43	45	45	42	42	42	43	39	39	42	43	43	44	44	44	45	44	44	47	45	44	43	42
June																																
Maximum.....	45	46	47	48	47	48	48	47	48	50	51	51	48	45	46	48	48	48	46	46	47	49	50	51	51	50	49	48	46	47	-	48
Minimum.....	43	45	46	47	46	47	46	45	47	49	50	49	45	44	45	46	45	45	45	46	45	48	49	50	49	49	48	46	45	46	-	47
July																																
Maximum.....	53	55	57	57	56	57	58	57	59	59	55	53	53	54	55	57	57	56	56	57	55	56	56	55	56	59	60	60	61	62	62	57
Minimum.....	48	51	54	55	54	53	55	56	55	56	54	51	51	50	52	53	54	55	55	55	55	55	55	54	53	55	57	58	59	60	60	54
August																																
Maximum.....	62	63	63	62	62	60	62	62	63	63	64	63	62	64	63	63	63	63	63	62	62	62	62	60	59	59	57	55	54	54	54	61
Minimum.....	60	61	61	60	60	60	60	59	60	61	61	61	61	61	62	61	60	60	61	62	61	62	61	59	59	55	54	54	54	53	54	59
September																																
Maximum.....	55	52	52	52	55	55	55	53	52	51	52	52	52	51	48	47	46	45	42	43	43	44	45	45	46	45	45	45	44	42	-	49
Minimum.....	52	51	52	52	52	54	53	52	52	51	51	52	51	49	47	46	45	41	41	42	43	43	44	44	45	44	45	44	42	42	-	47
October																																
Maximum.....	44	45	46	46	45	46	47	47	47	47	47	47	46	47	45	45	45	44	45	45	45	44	43	43	43	43	43	41	41	41	41	45
Minimum.....	42	42	44	44	44	45	46	46	46	46	45	45	45	45	45	44	44	43	44	45	44	43	43	43	42	42	41	40	40	40	41	44
November																																
Maximum.....	41	40	40	39	40	40	39	40	40	41	41	40	39	39	39	39	37	37	37	37	37	37	37	37	36	36	36	35	35	34	-	38
Minimum.....	40	39	39	39	39	39	39	39	40	40	40	39	39	39	39	37	36	36	37	37	37	37	37	36	36	36	36	35	34	32	-	38
December																																
Maximum.....	36	38	39	39	38	39	39	39	39	39	39	38	37	37	35	35	36	37	37	37	38	38	--	--	--	--	--	--	--	--	--	--
Minimum.....	33	36	38	38	38	39	39	39	39	39	38	37	37	34	34	35	35	36	36	36	37	37	--	--	--	--	--	--	--	--	--	--

267. Swan River near Bigfork, Mont. (12-3700)

Location.--At gaging station, lat 48°01'30", long 113°58'40", in SE¼SW¼ sec.11, T.26 N., R.19 W., on left bank 0.2 mile downstream from Johnson Creek, 0.4 mile downstream from Swan Lake, 5 miles southeast of Bigfork, and at mile 14.0. Datum of gage is 3,062.6 ft above mean sea level (from river-profile survey).

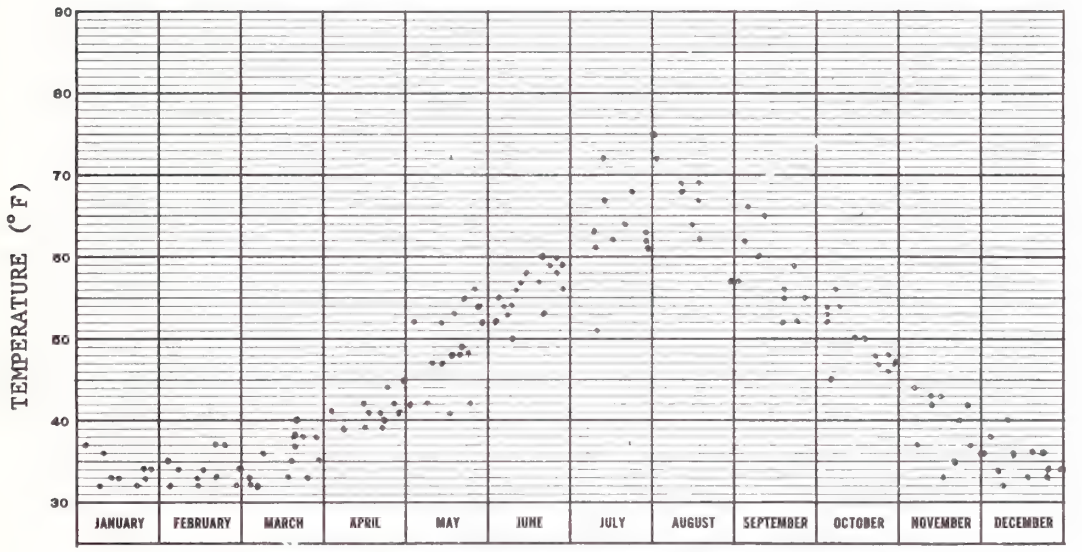
Drainage area.--671 sq mi.

Water temperature records available.--159 spot observations made at time of discharge measurements during period July 1949 to December 1965.

Extremes.--Discharge 1922-65: Maximum, 8,400 cfs May 24, 1948; minimum observed, 193 cfs Jan. 26-29, 1930.

Water temperatures 1949-65: Maximum observed, 75°F Aug. 1, 1956; minimum, freezing point on many days during winter months.

Remarks.--Temperatures are affected by natural storage in Swan Lake.



Spot observations of water temperatures, 1949-65

267. Swan River near Bigfork, Mont. (12-3700)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
12-54	1600	36	14-50	1500	33	23-50	1130	37	9-51	1200	39	7-50	1600	42	8-53	1200	53
28-54	1600	34	9-53	1500	34	12-53	1430	36	17-52	1600	41	25-50	1200	42	9-54	1530	54
14-55	1530	33	15-55	1500	33	3-54	1100	32	16-53	1030	39	10-51	1100	47	10-55	1500	56
27-56	1430	33	27-56	0900	32	22-54	1100	35	21-54	1100	39	26-52	1600	56	23-55	1030	59
10-57	1140	32	15-57	1600	32	21-55	1500	33	25-55	1500	44	18-53	1200	53	25-56	1500	58
28-59	1530	34	21-58	1400	37	22-56	1430	33	26-56	1600	42	17-54	1130	41	25-57	1230	60
27-60	1430	34	26-59	1430	32	27-57	1200	33	16-58	1330	42	24-55	1330	48	12-58	1530	57
23-61	1100	32	17-60	1530	34	25-58	1430	38	20-61	0930	41	3-57	1500	52	7-59	1030	54
29-62	1600	34	23-61	1200	37	30-59	1500	35	3-62	1530	41	17-57	1200	53	19-59	1400	57
3-63	1600	37	28-62	1030	34	29-60	1400	38	27-62	1500	42	13-58	1500	52	29-59	1000	56
16-64	1030	33	5-63	1000	32	20-61	1100	38	18-63	1000	41	1-59	1600	42	6-60	1430	55
			20-64	1030	33	6-63	1030	32	28-64	1100	41	21-59	1230	48	13-60	1130	58
			4-65	1505	35	20-64	1400	40	30-64	1400	45	13-60	1800	47	19-61	1000	60
						4-65	1010	33	22-65	1035	40	17-61	1200	48	11-62	1530	56
												28-61	1700	54	27-63	1000	59
												29-62	1700	52	12-64	1100	50
												21-63	1100	55	20-64	1030	53
												21-64	1500	49	4-65	1710	52
July			August			September			October			November			December		
16-49	1100	67	21-52	1630	67	25-52	1045	59	22-51	1445	47	6-49	1430	37	8-49	1230	32
22-52	1630	64	12-53	1500	69	11-53	0930	60	27-52	1215	48	26-52	1500	37	31-52	1500	34
13-53	1300	51	19-54	1030	64	21-55	1530	56	7-53	1030	54	26-54	1530	42	10-53	1530	40
12-54	1200	61	1-56	1500	75	5-56	1500	66	6-54	1530	56	14-57	1400	42	16-54	1000	36
29-55	0900	62	2-57	1030	72	10-57	1330	65	21-54	1500	48	18-58	1200	33	6-55	1500	34
16-58	1330	72	21-57	1330	62	28-59	1500	55	27-55	1430	46	5-59	1530	44	3-56	1315	38
29-59	1100	63	21-58	1230	69	21-61	1000	55	3-57	1345	54	23-60	1530	40	26-56	1500	33
26-60	1400	68	31-59	1030	57	26-62	1000	52	15-58	1030	50	21-61	1000	35	12-57	1430	36
26-61	0930	68	21-61	1130	69	4-63	1000	62	3-60	1030	53	14-63	0930	43	1-59	1300	36
19-62	1530	62	22-62	0930	62	2-64	0955	57	17-61	1100	50	16-65	1435	43	15-60	1600	33
30-63	0900	61	12-65	1440	68	21-65	1535	52	30-62	0930	47				27-61	1130	34
21-64	1130	64							8-63	0930	45				17-63	1000	36
9-65	1050	63							5-64	1200	52				21-65	1430	36

268. Flathead River near Polson, Mont. (12-3720)

Location.--At gaging station, lat 47°40'50", long 114°15'10", in NW¼SE¼ sec.11, T.22 N., R.21 W., on left bank 0.5 mile downstream from Kerr Dam, 4 miles west of Polson, 5.0 miles downstream from Flathead Lake, and at mile 71.5. Datum of gage is 2,693.70 ft above mean sea level (levels by The Montana Power Co.).

Drainage area.--7,096 sq mi.

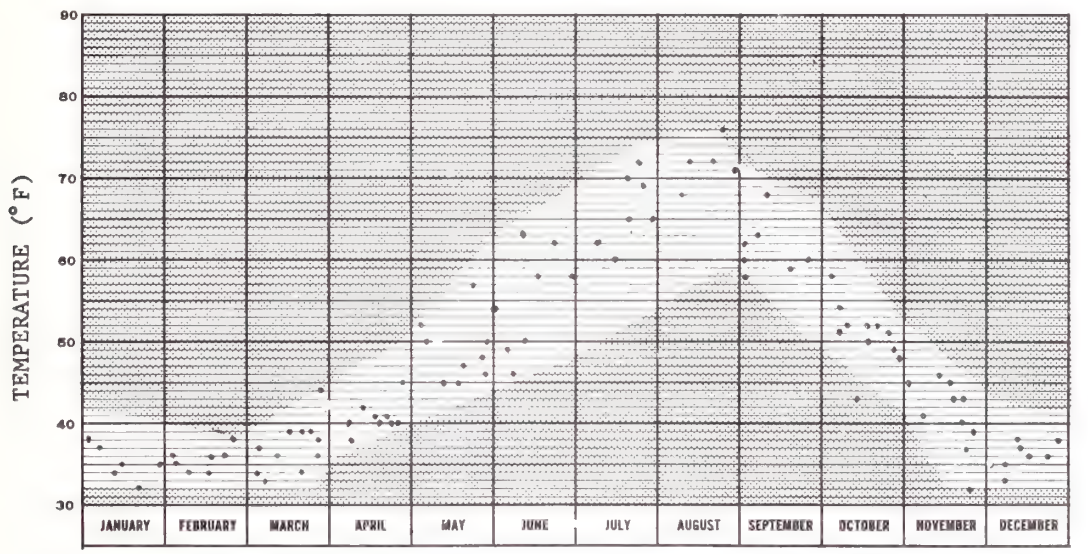
Water temperature records available.--101 spot observations made at time of discharge measurements during period November 1949 to December 1965. Daily maximum and minimum from hourly readings at Kerr Dam during period October 1954 to December 1961 and from readings made during day shift January 1962 to December 1965 published in this report. Records of daily temperature data from beginning of operation of Kerr Dam in 1938 to September 1954 available in files of The Montana Power Co.

Extremes.--Discharge 1894, 1907-65: Maximum, about 110,000 cfs during flood of June 1894; minimum, probably less than 5 cfs Apr. 13, 1958.

Water temperatures 1949-65: Maximum observed, 76°F Aug. 25, 1958; minimum, freezing point on many days during winter months.

Remarks.--Water temperature affected by storage in Flathead Lake. Daily temperatures are taken in Kerr Dam in penstock at elevation of about 2,850 ft (full pond, 2,893 ft).

Cooperation.--Daily temperatures furnished by The Montana Power Co.



Spot observations of water temperatures, 1949-65.
The unshaded area delineates the range between the highest and lowest monthly temperatures from hourly observations, 1954-65.

PEND OREILLE RIVER BASIN

268. Flathead River near Polson, Mont. (12-3720)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
14-55	1200	34	16-54	1330	36	22-50	1630	39	16-54	1300	42	29-54	1130	46	6-56	1530	46
23-61	1400	32	15-55	1200	34	11-54	1430	36	25-56	1330	40	3-57	1145	52	9-58	1230	63
30-62	--	35	21-56	1330	36	19-56	1500	34	23-59	1430	40	5-58	1040	50	23-59	1330	62
3-63	--	38	8-57	1500	34	25-57	1230	36	13-60	1430	38	28-59	1230	48	30-59	1200	58
16-64	1430	35	3-59	1300	36	28-58	1300	44	20-61	1200	41	16-60	1530	45	13-60	1500	58
6-65	1055	37	23-61	1500	38	3-59	1130	34	9-62	--	40	17-61	1430	47	1-61	1310	54
			20-64	1500	36	25-60	1400	38	27-62	--	45	29-62	--	50	10-64	1500	50
			4-65	1030	35	20-61	1430	39	18-63	--	40	22-63	--	57	4-65	1210	49
						7-62	--	33	22-65	1450	41	12-64	1500	45			
						6-63	--	33									
						17-64	1400	39									
						4-65	1300	37									
July			August			September			October			November			December		
15-55	1130	60	9-54	1235	68	2-54	1330	60	23-53	1230	51	6-49	1730	41	8-49	1630	33
20-56	1500	70	30-58	1300	71	8-55	1300	68	6-54	1230	52	13-52	1115	45	15-52	1110	37
28-59	1200	69	21-61	1400	72	6-60	1530	63	26-55	1500	49	10-54	1200	46	14-54	1330	38
26-60	0930	72	12-65	1140	72	21-61	1330	59	5-56	1430	54	23-56	1430	39	27-56	1530	38
26-61	1330	72				4-62	--	62	15-58	1500	52	20-59	1230	32	16-57	1400	37
19-62	--	65				26-62	--	60	15-59	1130	50	2-60	1400	45	8-60	1400	35
30-63	--	65				2-64	1430	58	3-60	1505	58	21-61	--	37	3-62	--	35
9-65	1400	62							17-61	1400	52	14-63	1430	43	17-63	1500	36
									30-62	--	48	16-64	1330	40	21-65	1145	36
									14-63	--	43	16-65	1130	43			
									5-64	1500	51						

Water temperatures (°F), October to December 1954

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum.....	56	57	55	55	53	52	52	52	52	52	52	52	51	50	50	50	50	50	50	50	49	49	49	49	48	47	46	46	46	46	46	50
Minimum.....	55	54	54	53	52	52	52	52	52	52	52	52	50	50	49	49	50	50	50	49	49	49	49	48	47	46	46	46	46	46	46	50
November																																
Maximum.....	46	46	46	45	45	44	44	45	45	46	46	46	45	45	45	44	44	44	44	44	44	45	45	45	45	44	43	43	43	42	-	45
Minimum.....	46	46	45	45	44	44	44	45	45	46	46	45	45	45	44	44	44	44	44	44	44	44	45	45	45	43	43	43	42	41	-	44
December																																
Maximum.....	41	40	40	40	40	40	40	40	40	40	40	40	39	39	39	39	38	38	38	38	38	37	37	37	37	37	37	35	36	36	37	38
Minimum.....	40	40	40	40	40	40	40	40	40	40	40	39	38	39	39	38	37	37	38	38	36	36	37	37	37	36	35	35	35	36	36	38

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1955

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	37	36	37	36	36	35	35	35	36	36	36	35	35	35	36	36	36	36	36	36	36	35	36	36	36	36	36	36	36	36	36	36
Minimum.....	37	36	36	36	35	35	35	35	34	36	34	34	35	34	35	36	36	34	35	36	35	34	36	35	35	35	36	36	36	36	36	35
February																																
Maximum.....	37	37	37	37	36	36	36	37	37	36	36	35	34	35	36	36	36	36	35	34	34	34	34	34	34	33	32	32	-	-	-	35
Minimum.....	36	36	36	36	36	36	35	36	37	37	35	34	34	34	35	36	36	34	34	34	34	34	34	33	33	33	33	32	-	-	-	35
March																																
Maximum.....	32	33	33	33	33	34	34	34	34	35	35	34	34	34	35	35	35	36	36	35	34	34	34	34	33	33	34	34	35	36	36	34
Minimum.....	32	32	33	33	33	33	34	34	34	34	34	34	34	34	34	34	35	35	35	34	34	34	34	33	32	33	33	34	34	35	36	34
April																																
Maximum.....	37	38	37	37	36	37	38	41	42	42	42	40	40	39	40	39	40	42	42	41	40	41	41	41	40	42	50	42	40	42	-	40
Minimum.....	36	37	37	36	36	36	37	38	40	41	40	40	40	39	39	38	38	40	41	41	40	40	41	40	39	39	48	40	40	40	-	39
May																																
Maximum.....	44	44	45	45	46	48	45	47	48	46	46	46	46	46	48	46	46	46	47	48	48	49	48	47	50	50	50	48	48	49	48	47
Minimum.....	42	44	45	44	45	44	44	44	46	45	44	45	45	45	46	44	45	45	45	47	48	48	46	46	47	50	48	47	47	47	46	46
June																																
Maximum.....	46	46	47	47	47	48	49	52	52	53	56	57	57	56	56	56	56	55	54	57	58	61	61	62	62	61	61	60	60	59	-	55
Minimum.....	44	45	47	47	46	47	48	49	52	52	54	56	56	55	55	55	55	54	53	53	56	58	60	61	59	59	59	59	59	57	-	54
July																																
Maximum.....	57	56	53	52	52	50	52	54	55	55	54	55	59	60	62	66	67	68	68	68	70	70	70	70	70	71	71	70	70	68	68	62
Minimum.....	56	54	50	50	49	49	51	52	53	53	53	54	55	58	60	62	66	67	67	68	68	69	69	70	70	70	70	69	68	68	67	61
August																																
Maximum.....	67	67	67	66	67	68	68	68	69	69	70	70	69	69	70	70	70	70	70	70	70	70	70	70	70	70	69	68	68	68	69	69
Minimum.....	67	66	66	66	66	67	68	68	68	68	69	68	69	69	69	69	69	70	70	70	69	69	69	70	69	68	68	68	68	68	68	68
September																																
Maximum.....	68	69	69	70	70	70	70	70	68	68	68	67	66	66	65	63	62	62	61	61	60	58	57	57	56	56	56	56	55	54	-	63
Minimum.....	68	68	68	68	69	70	70	68	68	68	67	66	65	64	63	62	62	61	60	60	58	57	56	56	56	56	56	55	54	53	-	62
October																																
Maximum.....	53	54	54	54	54	53	52	52	51	51	50	50	50	50	50	51	51	52	52	52	52	52	52	50	50	50	50	49	48	47	47	51
Minimum.....	53	53	54	54	53	52	51	51	51	50	50	50	50	50	50	50	50	51	51	52	52	52	50	50	50	50	49	48	47	47	45	51
November																																
Maximum.....	46	44	43	43	43	44	43	42	42	42	42	42	39	35	33	33	33	33	34	35	36	36	36	36	38	38	37	37	37	36	-	39
Minimum.....	44	43	43	43	43	43	42	42	42	42	42	39	35	33	32	33	32	33	33	34	35	35	35	36	36	37	36	36	36	36	-	38
December																																
Maximum.....	36	36	36	37	37	37	36	36	36	36	36	37	36	36	34	34	33	33	34	34	34	34	34	34	34	34	34	35	35	34	33	35
Minimum.....	36	36	36	36	36	36	36	35	35	36	36	36	36	34	34	33	33	33	33	34	34	34	34	34	33	34	34	34	34	33	33	35

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1956

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	34	34	34	34	34	34	35	36	36	35	35	35	35	34	34	34	33	33	33	34	34	34	34	34	34	33	33	33	33	34	34	34
Minimum.....	33	33	34	34	34	34	34	35	35	35	35	35	34	34	34	33	33	33	33	33	34	34	34	34	33	33	33	33	33	33	34	34
February																																
Maximum.....	34	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	-	-	34
Minimum.....	33	33	33	34	34	34	34	34	34	34	34	34	34	34	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	-	-	34
March																																
Maximum.....	34	35	35	35	35	35	35	35	36	35	34	35	35	34	35	35	36	36	36	36	36	36	36	37	37	38	37	37	38	38	38	36
Minimum.....	34	34	35	34	34	35	34	35	34	34	34	34	34	34	35	35	35	35	35	36	36	36	36	36	36	36	36	36	37	38	38	35
April																																
Maximum.....	38	39	39	39	40	37	38	37	39	40	41	41	44	44	44	45	45	46	46	45	45	46	44	43	43	42	43	43	42	41	-	42
Minimum.....	36	37	37	38	38	36	36	36	37	39	41	41	42	43	44	44	44	44	44	44	44	43	43	42	41	42	42	42	41	41	-	41
May																																
Maximum.....	42	42	40	41	41	42	44	44	46	46	44	44	44	45	46	48	48	50	50	52	52	52	52	52	54	54	55	56	56	57	58	48
Minimum.....	41	40	40	41	41	41	42	44	44	46	46	42	42	43	44	45	47	48	50	50	50	50	50	51	52	52	53	55	54	54	56	47
June																																
Maximum.....	58	58	58	58	56	47	49	50	50	53	54	55	56	58	59	57	55	56	58	57	53	54	55	53	54	54	57	58	58	58	-	55
Minimum.....	57	57	57	56	45	45	47	48	49	50	53	53	54	56	57	55	54	55	56	54	52	53	53	53	53	54	55	57	57	56	-	53
July																																
Maximum.....	59	59	59	58	58	59	60	62	64	64	66	68	68	68	67	67	68	70	70	71	72	72	72	72	72	73	72	73	74	74	74	67
Minimum.....	57	58	58	58	58	58	59	60	62	64	64	66	67	67	66	66	67	68	69	70	71	72	72	72	72	72	72	73	73	73	74	66
August																																
Maximum.....	74	74	72	71	70	70	70	70	70	70	70	70	70	70	71	71	71	71	71	70	71	71	71	71	71	70	70	70	68	67	66	70
Minimum.....	73	72	71	70	70	70	70	70	70	70	70	69	69	70	70	70	71	71	70	70	70	70	70	70	70	70	70	69	67	66	64	70
September																																
Maximum.....	64	64	63	68	62	61	60	61	61	62	62	62	62	63	63	63	63	63	63	63	63	61	60	60	59	59	59	59	57	56	-	62
Minimum.....	64	63	63	62	61	60	60	60	61	61	62	62	62	62	62	62	62	62	63	63	61	60	59	59	58	58	59	57	56	56	-	61
October																																
Maximum.....	56	56	56	55	55	55	55	55	55	56	55	55	55	53	52	52	51	51	50	50	50	50	49	48	48	47	46	46	46	44	44	51
Minimum.....	56	56	55	55	55	55	55	55	55	55	55	55	54	52	51	51	50	50	50	50	50	49	48	48	47	46	46	46	44	44	44	51
November																																
Maximum.....	43	43	42	42	41	42	42	42	43	43	44	44	44	44	42	42	41	41	40	39	39	39	40	40	40	40	40	40	38	38	-	41
Minimum.....	43	42	42	41	41	41	42	42	42	43	43	44	44	42	42	41	41	40	38	38	38	39	39	39	39	39	39	38	38	38	-	41
December																																
Maximum.....	38	38	40	40	39	34	34	33	34	35	35	35	35	37	38	38	39	39	39	39	38	38	37	37	37	37	38	38	37	37	37	37
Minimum.....	37	37	38	39	34	33	33	33	33	34	35	34	34	35	37	38	38	39	38	38	38	38	37	37	37	37	37	37	37	37	37	36

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1957

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	37	37	37	37	37	36	36	36	34	34	34	34	34	34	34	32	33	33	34	34	34	34	34	34	34	33	33	32	33	33	33	34
Minimum.....	37	37	37	37	36	36	36	34	33	33	34	34	34	34	32	32	32	33	33	33	33	34	34	34	34	33	32	32	33	33	33	34
February																																
Maximum.....	33	33	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	-	-	-	34
Minimum.....	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	-	-	-	34
March																																
Maximum.....	36	36	36	36	35	35	35	36	35	35	36	36	35	36	36	36	36	36	36	37	37	37	36	37	38	38	38	38	39	39	39	36
Minimum.....	35	35	36	35	34	35	35	34	35	35	35	35	35	35	35	36	36	36	36	36	36	36	36	36	37	37	37	37	38	39	39	36
April																																
Maximum.....	39	40	40	40	41	41	40	38	39	41	41	40	40	40	41	42	43	44	44	46	48	48	49	49	49	46	44	45	47	50	-	43
Minimum.....	39	39	39	40	40	40	38	38	38	39	40	40	40	40	41	41	42	43	43	44	46	47	48	48	46	44	43	43	45	48	-	42
May																																
Maximum.....	52	53	54	55	54	53	52	52	52	51	50	52	52	51	51	52	53	53	52	51	49	48	47	47	48	49	50	50	54	56	60	52
Minimum.....	51	52	52	54	53	51	50	50	50	49	49	50	50	49	50	51	52	52	51	49	48	44	44	46	46	48	48	49	50	54	56	50
June																																
Maximum.....	60	60	60	63	65	65	64	63	62	61	60	54	52	52	54	54	56	57	58	59	59	59	60	60	60	60	59	58	58	59	-	59
Minimum.....	58	58	59	60	62	62	62	61	61	60	54	52	51	51	52	54	54	56	56	58	58	58	59	59	59	59	58	58	58	58	-	58
July																																
Maximum.....	61	61	62	61	62	62	62	62	63	65	66	67	67	68	68	68	68	68	68	68	69	69	70	70	70	70	70	72	70	71	72	67
Minimum.....	59	60	61	60	61	61	60	61	62	63	64	66	67	67	67	68	68	67	67	67	68	68	69	69	70	70	70	70	70	70	70	66
August																																
Maximum.....	71	71	71	70	70	70	70	70	70	70	70	70	70	70	70	70	71	70	71	71	70	70	71	70	71	70	69	68	68	67	67	70
Minimum.....	71	71	70	69	69	69	69	69	69	69	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	69	68	68	67	67	66	69
September																																
Maximum.....	66	66	66	66	66	66	66	66	65	64	64	64	64	64	64	64	63	63	60	59	58	58	58	59	59	60	60	60	60	60	-	63
Minimum.....	66	66	66	65	66	66	66	65	64	64	64	64	63	63	63	63	63	60	58	58	58	58	58	58	58	59	59	60	60	60	-	62
October																																
Maximum.....	60	60	60	59	56	55	55	53	52	51	51	52	52	52	52	52	52	51	51	50	50	50	48	47	46	46	45	45	45	45	46	51
Minimum.....	60	60	59	56	55	55	53	52	51	51	51	51	52	52	52	52	51	51	50	50	50	48	46	46	45	45	45	45	45	45	45	51
November																																
Maximum.....	46	45	45	44	44	43	43	42	42	42	42	43	43	43	42	42	42	42	42	41	41	40	40	41	41	41	41	41	40	39	-	42
Minimum.....	45	44	44	44	43	42	42	42	42	42	42	42	42	42	42	42	42	42	41	41	40	40	40	40	41	41	41	39	39	39	-	42
December																																
Maximum.....	38	39	38	39	39	39	39	39	39	39	39	39	39	38	39	38	39	39	38	38	39	38	38	37	37	37	37	36	37	36	36	38
Minimum.....	38	38	38	38	39	38	38	39	39	39	39	39	38	38	38	38	38	39	38	38	38	38	37	36	36	36	36	36	36	36	35	38

PEND OREILLE RIVER BASIN

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1958

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	35	35	35	35	35	34	35	35	34	35	35	36	36	36	35	37	37	37	37	37	36	36	36	36	36	36	36	36	36	36	36	36
Minimum.....	35	34	34	35	34	34	35	34	34	34	35	35	36	35	35	35	37	37	37	36	36	36	36	36	36	36	36	36	36	36	36	35
February																																
Maximum.....	36	36	36	36	36	36	36	36	35	35	35	35	35	35	34	34	34	34	34	34	35	36	36	37	38	38	38	38	-	-	-	36
Minimum.....	36	36	36	36	36	36	36	35	34	34	35	35	35	34	34	34	34	34	34	34	34	35	36	36	37	38	38	37	-	-	-	35
March																																
Maximum.....	37	37	37	37	37	37	37	38	38	38	38	38	38	37	37	37	37	38	38	39	39	41	41	42	43	44	44	44	44	43	-	39
Minimum.....	37	37	36	36	37	37	37	37	37	37	38	38	37	37	37	37	36	37	38	38	39	40	41	41	42	43	44	44	43	43	-	39
April																																
Maximum.....	--	--	--	--	44	44	44	45	45	44	46	46	47	48	48	46	45	45	45	45	45	45	44	44	45	46	46	47	48	48	-	46
Minimum.....	--	--	--	--	42	42	43	44	44	44	44	45	45	47	46	44	44	44	44	44	44	43	42	44	45	45	45	46	47	47	-	44
May																																
Maximum.....	49	49	49	50	52	52	54	56	56	53	53	53	51	50	50	50	50	51	54	56	58	60	61	61	61	60	62	62	62	63	63	55
Minimum.....	48	49	48	48	50	52	53	54	54	51	52	51	48	48	49	48	47	50	52	54	56	58	60	60	60	59	58	60	60	61	62	54
June																																
Maximum.....	62	62	61	60	61	62	63	63	63	60	60	60	58	58	60	62	63	64	65	65	65	66	67	67	67	67	68	68	65	65	-	63
Minimum.....	60	61	60	59	60	61	62	62	61	60	56	58	58	58	58	60	62	63	64	64	64	65	66	67	66	66	67	66	64	64	-	62
July																																
Maximum.....	64	62	62	62	63	64	64	64	64	65	66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum.....	62	62	61	61	62	63	64	63	64	64	65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
August																																
Maximum.....	74	73	72	72	72	72	72	72	72	72	73	72	73	73	73	73	74	74	74	74	74	74	74	75	76	75	75	--	--	--	72	73
Minimum.....	72	72	72	72	72	72	72	72	72	72	72	72	70	73	73	73	73	73	74	74	74	74	74	74	75	75	75	--	--	--	71	73
September																																
Maximum.....	72	70	68	67	67	66	66	66	67	68	68	68	68	67	65	64	64	64	63	62	61	60	59	58	57	56	55	55	55	55	-	63
Minimum.....	70	68	66	66	66	66	66	66	67	67	68	68	67	66	64	64	63	63	62	61	60	59	58	57	56	54	54	54	55	54	-	63
October																																
Maximum.....	56	56	57	56	56	56	56	56	55	54	53	53	53	53	53	53	53	53	53	53	52	51	51	50	50	49	49	48	48	48	48	53
Minimum.....	54	55	56	56	56	56	56	55	54	53	53	53	53	53	53	53	53	53	53	52	51	51	50	50	49	49	48	48	48	48	47	52
November																																
Maximum.....	47	47	46	46	45	45	45	45	45	44	44	44	43	43	42	42	39	38	38	38	39	39	39	39	40	39	39	38	37	37	-	42
Minimum.....	47	46	46	45	45	45	45	44	44	44	44	43	43	42	42	39	38	38	38	38	38	39	39	39	39	39	38	37	37	36	-	41
December																																
Maximum.....	36	37	37	37	38	37	36	36	35	35	34	36	36	37	37	38	38	38	39	39	38	38	38	38	38	38	38	38	38	38	38	37
Minimum.....	36	36	37	37	37	35	35	34	34	34	34	34	36	37	37	37	37	37	38	38	38	38	38	38	38	38	38	38	38	37	38	37

PEND OREILLE RIVER BASIN

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1959

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	38	38	35	34	34	34	35	35	35	36	36	37	38	41	38	38	38	37	37	37	36	35	35	35	36	36	37	37	36	37	37	36
Minimum.....	38	35	34	33	33	34	34	35	35	35	36	36	37	39	38	38	37	37	37	36	35	34	34	35	35	35	36	36	36	36	36	36
February																																
Maximum.....	37	36	35	35	35	35	35	34	34	34	35	35	35	35	35	34	34	33	33	33	33	34	34	35	35	35	35	35	-	-	-	35
Minimum.....	36	35	35	35	35	35	34	34	33	34	34	34	34	35	34	34	33	32	32	33	33	34	34	34	35	35	35	35	-	-	-	34
March																																
Maximum.....	36	36	36	36	36	36	37	37	37	37	37	37	38	37	36	36	37	38	39	39	39	39	39	40	41	42	42	41	39	39	39	38
Minimum.....	35	35	36	36	36	36	36	37	37	37	37	37	37	36	36	36	36	37	38	38	38	39	39	39	40	41	41	39	39	39	39	37
April																																
Maximum.....	40	41	42	43	42	42	42	42	43	43	43	43	44	44	43	42	43	43	43	43	44	44	43	43	43	42	41	41	41	42	-	43
Minimum.....	39	40	41	42	42	42	40	41	42	42	42	43	43	43	41	40	41	42	42	42	43	43	42	41	41	41	41	41	41	41	-	42
May																																
Maximum.....	43	43	43	44	44	43	45	46	45	44	44	45	47	48	49	49	46	45	45	45	46	47	48	48	48	48	50	50	50	51	52	46
Minimum.....	42	42	42	42	43	42	43	45	44	42	42	43	45	46	47	46	44	44	43	44	45	46	47	48	48	47	48	49	48	49	50	45
June																																
Maximum.....	53	55	55	55	54	54	55	54	53	53	52	53	53	54	57	57	57	58	61	64	65	63	65	65	64	63	62	59	60	60	-	58
Minimum.....	52	53	54	53	53	53	53	52	52	52	50	52	52	53	55	56	56	57	58	62	62	62	63	64	63	60	59	58	58	60	-	56
July																																
Maximum.....	62	61	60	60	61	61	60	62	64	62	63	64	66	64	66	68	70	70	71	72	72	74	74	74	74	74	73	73	70	68	69	67
Minimum.....	60	60	60	59	59	60	59	59	62	60	62	63	64	62	64	65	68	68	69	71	72	73	74	74	74	73	72	70	68	68	68	66
August																																
Maximum.....	69	69	69	69	69	68	69	68	69	69	69	69	69	69	68	68	68	68	67	67	66	66	65	65	64	64	64	64	63	63	63	67
Minimum.....	68	68	69	68	68	68	68	68	68	69	69	69	69	68	68	68	67	67	67	66	66	65	64	64	64	64	64	63	63	63	63	67
September																																
Maximum.....	63	62	62	62	62	61	60	60	59	58	58	59	60	60	61	61	60	59	58	58	58	58	58	58	58	58	57	56	56	55	-	59
Minimum.....	62	61	62	62	61	60	60	59	58	57	58	58	59	59	60	60	59	59	58	58	58	58	58	58	53	57	56	55	55	54	-	59
October																																
Maximum.....	54	54	53	54	54	54	53	53	51	50	50	50	50	50	51	51	51	51	51	51	51	50	50	50	50	50	49	49	49	48	48	51
Minimum.....	54	53	53	53	53	53	53	51	50	49	49	50	50	50	50	51	50	51	51	51	50	50	50	50	50	49	49	49	48	48	48	51
November																																
Maximum.....	48	47	48	48	45	45	44	44	44	44	43	42	40	38	38	34	32	32	33	33	34	35	35	37	37	36	37	38	39	38	-	40
Minimum.....	47	47	47	45	45	44	44	44	44	43	42	40	38	38	34	33	32	32	32	33	33	33	35	35	36	36	36	37	38	38	-	39
December																																
Maximum.....	38	38	38	38	38	38	39	37	37	37	37	37	37	36	37	39	39	38	38	38	37	37	37	38	38	38	37	36	35	34	34	37
Minimum.....	38	38	38	38	38	38	38	36	37	36	36	36	37	36	36	37	37	37	38	37	37	36	37	38	38	37	36	35	34	34	34	37

PEND OREILLE RIVER BASIN

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1960

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	34	32	32	32	32	33	33	33	34	33	34	34	34	34	34	34	34	34	34	33	33	33	33	33	33	33	33	34	34	34	34	33
Minimum.....	33	32	32	32	32	32	32	32	33	33	33	34	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33	33	34	34	34	33
February																																
Maximum.....	34	35	35	35	36	36	36	35	35	35	35	35	35	35	35	35	34	34	35	34	35	34	34	34	34	32	32	33	33	-	-	34
Minimum.....	34	34	35	35	35	36	35	35	35	35	34	35	35	35	35	34	34	34	34	34	34	34	34	34	32	32	32	32	33	-	-	34
March																																
Maximum.....	34	34	35	35	34	34	34	34	34	33	34	34	34	34	34	34	34	35	36	37	38	38	38	38	39	39	39	39	38	37	38	36
Minimum.....	33	34	34	34	34	34	34	34	33	33	33	34	34	34	34	34	34	34	35	35	36	36	36	37	37	38	38	38	36	36	37	35
April																																
Maximum.....	38	38	39	41	42	42	42	43	43	42	40	39	40	39	39	39	39	40	40	40	40	40	40	40	40	41	41	42	42	43	-	40
Minimum.....	37	38	38	39	41	41	40	42	42	40	39	39	39	39	38	38	38	39	40	39	39	40	40	40	39	39	41	41	40	41	-	40
May																																
Maximum.....	43	43	44	46	46	47	48	48	47	48	49	51	51	51	46	46	45	43	42	45	45	45	45	44	45	46	46	46	48	48	50	46
Minimum.....	42	42	42	44	46	46	47	47	45	45	48	49	51	46	44	45	42	42	42	42	43	43	44	44	44	44	45	46	46	48	48	45
June																																
Maximum.....	50	50	50	51	54	54	53	53	54	58	58	58	59	58	56	55	53	52	53	53	51	50	52	52	53	55	56	58	59	62	-	54
Minimum.....	49	48	50	50	51	53	52	52	53	54	58	57	58	56	54	53	50	51	52	51	50	50	50	52	52	53	54	55	58	60	-	53
July																																
Maximum.....	62	62	62	64	64	65	67	67	68	67	68	68	70	71	72	72	72	73	74	74	74	74	74	74	73	72	73	73	73	74	74	70
Minimum.....	62	62	61	62	63	64	66	66	67	66	67	68	68	70	71	72	72	72	73	74	74	74	74	73	72	72	72	72	73	73	73	69
August																																
Maximum.....	73	73	72	72	71	71	71	71	71	71	71	71	71	71	71	71	70	69	69	69	69	68	68	67	65	64	64	63	62	61	61	68
Minimum.....	73	73	72	71	71	71	71	70	70	70	70	71	71	71	70	70	69	69	68	68	68	68	67	65	64	64	63	62	61	60	60	67
September																																
Maximum.....	61	61	62	62	62	62	62	61	60	60	60	60	61	62	62	62	62	62	62	62	61	61	61	60	59	60	59	59	59	58	-	61
Minimum.....	60	60	62	62	62	62	61	60	60	60	60	60	60	61	62	62	61	61	62	61	61	60	60	60	59	59	58	58	58	58	-	60
October																																
Maximum.....	58	58	58	58	58	58	58	58	57	56	55	54	52	51	50	50	50	50	50	50	50	50	50	50	50	50	49	49	48	47	47	53
Minimum.....	58	58	58	58	58	58	58	57	56	55	54	52	51	50	50	50	50	50	50	50	50	50	50	50	50	49	48	48	47	47	46	52
November																																
Maximum.....	46	46	45	45	44	44	43	43	42	42	41	41	41	41	41	40	40	40	40	40	40	40	40	39	39	39	40	40	39	39	-	41
Minimum.....	46	45	45	44	44	43	43	42	42	41	41	40	40	41	40	40	40	40	40	40	40	40	39	39	39	39	39	40	39	38	-	41
December																																
Maximum.....	38	38	38	38	38	36	36	35	34	36	36	35	35	35	34	34	34	34	35	36	36	36	36	36	36	35	35	35	36	36	36	36
Minimum.....	38	38	38	37	36	36	35	34	34	34	35	35	35	35	34	34	34	34	34	35	36	35	35	36	35	35	35	34	34	35	35	35

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1961

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	35	34	33	33	32	32	34	34	34	34	35	35	36	36	36	38	38	38	38	37	37	36	36	35	34	34	33	33	33	33	34	35
Minimum.....	34	33	32	32	32	32	32	34	34	34	34	35	35	36	36	36	38	38	38	37	36	36	35	34	34	34	33	33	33	33	34	34
February																																
Maximum.....	35	35	35	35	35	36	36	37	37	37	38	38	38	37	37	38	38	38	37	37	37	38	38	38	38	38	38	37	-	-	-	37
Minimum.....	34	34	34	34	34	34	35	36	36	36	37	38	37	37	36	37	37	37	37	37	37	38	38	38	37	37	37	37	-	-	-	36
March																																
Maximum.....	37	37	37	36	35	36	36	36	37	37	38	37	38	38	39	39	39	39	40	41	41	41	40	41	41	41	41	41	41	42	42	39
Minimum.....	37	37	37	36	35	35	36	36	36	36	37	37	37	38	38	39	39	39	39	40	40	40	40	40	41	41	41	41	41	41	42	38
April																																
Maximum.....	42	42	41	41	41	42	42	42	42	42	40	40	40	40	40	40	42	43	43	42	42	42	43	43	43	42	42	42	42	43	-	42
Minimum.....	41	41	41	40	40	41	42	42	42	40	40	40	40	40	40	40	41	42	42	42	42	42	43	42	42	42	42	41	41	42	-	41
May																																
Maximum.....	44	45	44	46	44	44	42	43	44	45	45	46	46	46	48	48	48	48	48	51	52	52	53	52	54	54	54	54	54	54	54	48
Minimum.....	43	44	44	44	44	42	41	42	43	44	44	44	46	45	45	47	47	47	50	48	50	50	51	51	52	54	54	52	52	53	53	47
June																																
Maximum.....	56	57	58	59	59	59	60	58	58	58	60	59	59	60	61	62	64	65	66	67	66	66	66	68	68	67	66	66	67	67	-	62
Minimum.....	54	56	56	58	58	58	58	57	58	57	58	58	58	59	60	61	62	64	65	66	64	64	66	66	67	66	66	66	66	65	-	61
July																																
Maximum.....	67	66	66	66	67	67	68	68	68	69	70	70	71	72	72	72	72	72	72	72	72	73	74	73	73	73	72	72	72	72	72	70
Minimum.....	65	66	66	66	66	66	67	68	68	68	67	70	70	71	71	71	72	72	72	71	72	72	72	72	72	72	72	72	72	72	72	70
August																																
Maximum.....	73	72	73	74	75	75	75	75	74	74	74	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	73
Minimum.....	72	72	73	74	74	74	74	74	74	74	72	72	71	72	72	72	72	70	71	71	71	71	71	72	72	72	72	72	72	72	71	72
September																																
Maximum.....	71	71	71	69	68	68	68	68	66	66	64	64	62	61	61	61	60	60	60	60	60	59	58	56	55	55	54	54	54	53	-	62
Minimum.....	71	70	69	68	67	67	66	66	64	64	62	62	61	60	61	60	60	60	60	60	59	58	56	55	55	54	54	54	53	52	-	61
October																																
Maximum.....	52	52	52	52	53	53	53	53	52	52	52	51	50	50	51	52	52	51	50	50	50	48	48	46	46	46	45	44	44	42	42	49
Minimum.....	52	52	52	52	52	53	52	52	52	52	51	50	50	50	50	50	51	50	50	50	48	48	46	46	46	44	44	44	42	42	42	49
November																																
Maximum.....	42	43	41	40	40	40	40	40	40	40	40	40	39	39	39	38	38	37	37	37	37	36	36	36	36	35	35	35	35	35	-	38
Minimum.....	42	41	40	40	40	40	40	40	40	40	39	39	38	38	38	38	37	37	37	37	37	36	36	36	35	35	35	34	35	35	-	38
December																																
Maximum.....	36	36	36	36	36	36	35	34	34	34	34	33	33	34	34	34	35	35	35	36	36	35	35	35	35	35	35	34	35	35	35	35
Minimum.....	35	35	35	35	35	35	34	34	34	34	33	32	32	33	34	34	34	35	35	35	35	34	35	35	35	34	35	34	34	34	34	34

PEND OREILLE RIVER BASIN-

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1962

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	35	35	36	36	36	36	36	36	34	33	32	33	33	33	34	34	35	34	33	33	32	33	33	33	34	34	34	34	35	35		34
Minimum.....	34	35	35	36	36	35	35	34	33	32	32	32	32	32	33	34	33	33	33	32	32	32	32	33	33	34	34	34	34	34	34	33
February																																
Maximum.....	35	35	35	35	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	36	35	34	33	32	32	32	33	33	-	-	-	34
Minimum.....	34	35	35	34	33	33	33	34	34	34	34	34	34	35	35	35	35	34	34	34	33	33	32	32	32	32	32	33	-	-	-	34
March																																
Maximum.....	34	34	34	34	34	34	34	34	34	--	--	34	34	34	34	34	--	--	35	35	35	35	36	--	--	37	38	38	37	38	--		35
Minimum.....	33	34	34	34	34	34	34	34	34	--	--	34	34	34	34	34	--	--	35	35	35	35	36	--	--	37	38	38	37	38	--		35
April																																
Maximum.....	--	44	40	40	40	42	--	--	41	41	41	41	42	--	--	45	46	46	47	48	--	--	43	45	47	42	42	--	--	39	-	43
Minimum.....	--	43	40	39	39	41	--	--	41	41	41	41	42	--	--	45	46	46	47	48	--	--	43	45	45	42	42	--	--	39	-	43
May																																
Maximum.....	40	41	41	41	41	42	42	42	42	44	48	--	--	43	44	44	44	45	--	--	46	48	49	50	51	--	--	52	52	--	52		45
Minimum.....	40	41	41	41	41	42	41	42	42	44	48	--	--	43	44	44	44	45	--	--	46	47	48	50	50	--	--	52	52	--	52		45
June																																
Maximum.....	52	--	--	51	52	51	52	52	--	--	54	55	57	56	56	--	--	59	60	62	61	61	--	--	65	66	66	65	65	--	-	55
Minimum.....	52	--	--	51	52	51	52	52	--	--	53	55	57	56	56	--	--	59	60	61	60	61	--	--	64	66	66	65	65	--	-	55
July																																
Maximum.....																																
Minimum.....																																
August																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	68	69	--	--	68	68	68	67	68	--	--	67	66	66	64	63	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	68	68	--	--	68	68	68	67	68	--	--	67	66	66	64	63	--
September																																
Maximum.....	--	--	--	63	63	62	62	--	--	59	59	59	59	58	--	--	58	58	58	59	59	--	--	58	58	59	60	--	--	--	-	59
Minimum.....	--	--	--	63	63	62	62	--	--	59	59	59	58	58	--	--	58	58	58	58	59	--	--	58	58	59	60	--	--	--	-	59
October																																
Maximum.....	59	58	58	58	58	--	--	56	55	54	54	53	--	--	52	51	50	50	50	--	--	50	49	50	50	50	--	--	49	--	49		53
Minimum.....	59	58	58	58	58	--	--	56	55	54	54	53	--	--	52	51	50	50	50	--	--	49	49	50	50	50	--	--	49	--	49		53
November																																
Maximum.....	48	48	--	--	47	47	47	46	46	--	--	--	45	44	44	44	--	--	44	--	43	--	43	--	--	41	41	42	40	39	-		44
Minimum.....	48	48	--	--	47	47	47	46	46	--	--	--	45	44	44	44	--	--	43	--	43	--	43	--	--	41	41	41	40	39	-		44
December																																
Maximum.....	--	--	--	39	38	--	39	--	--	40	40	40	40	40	--	--	40	40	40	40	40	--	--	38	--	36	36	36	--	--	37		39
Minimum.....	--	--	--	39	38	--	39	--	--	40	40	40	40	40	--	--	40	40	40	40	40	--	--	38	--	36	36	36	--	--	37		39

PEND OREILLE RIVER BASIN

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1963

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	--	37	38	39	--	--	38	38	38	36	32	--	--	32	32	34	35	34	--	--	35	35	35	34	34	--	--	34	34	34	34	35
Minimum.....	--	37	38	39	--	--	38	38	38	34	32	--	--	32	32	34	35	34	--	--	35	35	35	34	34	--	--	34	34	34	34	35
February																																
Maximum.....	34	--	--	--	34	34	34	34	--	--	34	34	34	35	35	--	--	35	35	35	36	--	--	--	36	37	37	37	-	-	-	35
Minimum.....	34	--	--	--	34	34	34	34	--	--	34	34	34	35	35	--	--	35	35	35	36	--	--	--	36	37	37	37	-	-	-	35
March																																
Maximum.....	36	--	--	--	37	36	36	36	--	--	37	37	37	37	38	--	--	38	38	38	38	39	--	--	37	39	40	40	40	-	-	38
Minimum.....	36	--	--	--	37	36	36	36	--	--	37	37	37	37	37	--	--	38	38	38	38	39	--	--	37	38	39	40	40	-	-	38
April																																
Maximum.....	40	40	41	42	42	--	--	42	43	43	44	45	--	45	45	44	40	40	40	--	--	42	42	42	42	44	--	--	46	48	-	43
Minimum.....	40	40	41	42	42	--	--	42	42	43	44	45	--	45	45	43	40	40	40	--	--	42	42	42	42	44	--	--	46	48	-	43
May																																
Maximum.....	47	43	42	--	--	46	46	47	46	44	--	--	46	48	50	52	52	--	--	56	55	58	58	59	--	--	60	61	61	--	62	52
Minimum.....	45	42	42	--	--	46	46	47	46	44	--	--	46	47	48	50	52	--	--	54	55	56	58	59	--	--	60	61	61	--	62	51
June																																
Maximum.....	--	--	60	60	60	--	58	--	--	56	56	57	58	60	--	--	62	62	--	--	63	--	--	60	66	58	58	63	63	63	-	60
Minimum.....	--	--	58	58	60	--	58	--	--	56	56	57	58	59	--	--	62	62	--	--	63	--	--	60	59	58	58	59	63	63	-	59
July																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66	66	66	--	--	66	67	68	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66	66	66	--	--	66	66	67	--
August																																
Maximum.....	68	68	--	--	69	69	70	70	--	--	--	72	72	73	73	72	--	--	72	72	71	70	71	--	--	69	69	68	68	68	-	70
Minimum.....	68	68	--	--	69	69	70	70	--	--	--	72	72	72	73	72	--	--	72	72	71	70	71	--	--	69	69	68	68	68	-	70
September																																
Maximum.....	--	--	70	68	70	68	--	--	68	68	69	69	69	--	--	67	66	64	64	64	--	--	63	63	63	62	62	--	--	64	-	66
Minimum.....	--	--	70	68	68	68	--	--	68	68	69	69	69	--	--	67	66	64	64	64	--	--	63	63	63	62	62	--	--	63	-	66
October																																
Maximum.....	64	63	67	63	--	--	62	62	62	60	60	--	--	59	61	64	59	58	--	--	56	56	56	55	54	--	--	50	51	50	50	58
Minimum.....	63	62	67	63	--	--	62	62	61	60	60	--	--	59	61	63	58	58	--	--	56	56	56	55	54	--	--	50	50	49	50	58
November																																
Maximum.....	49	--	--	46	46	46	45	44	--	--	--	46	46	46	46	--	--	44	44	42	42	40	--	--	41	44	39	--	42	--	-	44
Minimum.....	48	--	--	46	46	46	45	44	--	--	--	46	46	46	46	--	--	44	44	42	42	40	--	--	40	42	39	--	42	--	-	44
December																																
Maximum.....	--	37	36	36	36	36	--	--	36	34	33	33	32	--	--	32	32	32	34	33	--	--	33	33	--	34	34	--	--	35	35	36
Minimum.....	--	37	36	36	36	36	--	--	36	33	33	33	32	--	--	32	32	32	34	33	--	--	33	33	--	34	34	--	--	35	35	36

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1964

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	--	36	36	--	--	36	35	35	34	34	--	--	34	34	34	34	34	--	--	34	34	34	34	34	--	--	34	34	34	34	36	34
Minimum.....	--	36	36	--	--	36	35	35	34	34	--	--	34	34	34	34	34	--	--	34	34	34	34	34	--	--	34	34	34	34	36	34
February																																
Maximum.....	--	--	36	36	36	36	36	--	--	36	36	36	36	36	--	--	36	36	36	36	36	--	--	36	36	36	35	35	--	-	-	36
Minimum.....	--	--	36	36	36	36	36	--	--	36	36	36	36	36	--	--	36	36	36	36	36	--	--	36	36	36	35	35	--	-	-	36
March																																
Maximum.....	--	36	36	36	36	36	--	--	35	35	34	35	36	--	-	36	37	38	38	38	--	--	36	34	32	33	33	--	--	39	40	36
Minimum.....	--	36	36	36	36	36	--	--	35	35	34	35	36	--	--	36	37	38	38	38	--	--	36	34	32	33	33	--	--	38	39	36
April																																
Maximum.....	41	41	41	--	--	42	42	44	42	42	--	--	42	42	40	40	40	--	--	42	44	44	44	43	--	--	42	42	42	43	-	42
Minimum.....	41	41	41	--	--	42	42	42	42	42	--	--	42	42	40	40	40	--	--	42	44	44	44	43	--	--	42	42	42	42	-	42
May																																
Maximum.....	44	--	--	45	41	41	41	42	--	--	44	46	47	47	47	--	--	50	52	54	53	49	--	--	45	47	52	50	50	--	--	47
Minimum.....	44	--	--	45	41	41	41	42	--	--	44	46	47	47	47	--	--	50	52	52	53	49	--	--	45	47	52	50	50	--	--	47
June																																
Maximum.....	50	50	50	50	50	--	--	52	51	52	51	50	--	--	50	52	52	52	52	--	--	53	53	53	54	56	--	--	58	58	-	52
Minimum.....	50	50	50	50	49	--	--	48	48	52	51	50	--	--	49	52	52	52	52	--	--	52	53	53	54	55	--	--	56	58	-	52
July																																
Maximum.....	58	63	62	--	--	60	60	62	62	62	--	--	66	66	66	66	64	--	--	66	67	68	68	67	--	--	70	68	68	68	68	65
Minimum.....	58	62	62	--	--	60	60	61	62	61	--	--	66	66	66	64	63	--	--	66	66	67	68	67	--	--	69	68	68	68	68	65
August																																
Maximum.....	--	--	66	66	66	66	66	--	--	67	67	67	67	66	--	--	67	68	68	66	66	--	--	66	65	65	64	64	--	--	64	66
Minimum.....	--	--	66	66	66	66	66	--	--	67	66	67	67	66	--	--	67	67	67	66	66	--	--	66	65	65	64	64	--	--	64	66
September																																
Maximum.....	62	62	60	60	--	--	--	60	60	60	60	--	--	55	56	56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	62	62	60	60	--	--	--	60	60	60	59	--	--	55	55	56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
October																																
Maximum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50	--	--
Minimum.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50	--	--
November																																
Maximum.....	--	50	50	50	50	46	--	--	50	50	--	50	48	--	--	46	46	46	46	46	--	--	46	46	46	--	42	--	--	38	-	47
Minimum.....	--	50	50	50	50	46	--	--	50	50	--	50	48	--	--	46	46	46	46	46	--	--	46	46	46	--	42	--	--	38	-	47
December																																
Maximum.....	38	38	40	40	38	--	38	39	40	39	39	38	36	37	36	34	36	36	--	--	36	38	40	38	--	--	--	36	36	36	36	38
Minimum.....	38	38	40	40	38	--	38	39	40	39	39	38	36	36	36	34	36	36	--	--	36	38	38	38	--	--	--	36	36	36	36	37

268. Flathead River near Polson, Mont. (12-3720)
Water temperatures (°F), calendar year 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	--	--	--	36	36	36	36	36	--	--	36	40	36	36	36	--	--	37	37	37	37	37	--	--	36	36	36	36	35	--	--	36
Minimum.....	--	--	--	36	36	36	36	36	--	--	36	40	36	36	36	--	--	36	37	37	37	37	--	--	36	36	36	36	35	--	--	36
February																																
Maximum.....	36	36	36	36	36	--	--	36	34	34	34	34	--	--	35	34	35	36	37	--	--	--	36	33	34	35	--	--	-	-	-	35
Minimum.....	36	36	36	36	36	--	--	35	34	34	34	34	--	--	35	34	35	36	36	--	--	--	33	33	34	35	--	--	-	-	-	35
March																																
Maximum.....	36	36	36	36	36	--	--	40	40	38	38	37	--	--	38	38	34	34	34	--	--	35	34	33	33	33	--	--	35	36	37	36
Minimum.....	35	35	36	36	36	--	--	40	40	38	38	37	--	--	38	37	34	33	34	--	--	35	34	33	33	33	--	--	35	36	37	36
April																																
Maximum.....	38	38	--	--	39	39	40	40	41	--	--	42	42	44	44	44	--	--	41	42	42	44	44	--	--	43	45	45	42	42	-	42
Minimum.....	38	38	--	--	39	39	40	40	41	--	--	42	42	44	44	44	--	--	41	42	41	44	44	--	--	43	45	45	42	42	-	42
May																																
Maximum.....	--	--	--	--	41	41	42	--	--	44	44	44	44	46	--	--	46	46	46	46	47	--	--	48	48	48	49	49	--	--	--	45
Minimum.....	--	--	--	--	41	41	42	--	--	43	44	44	44	46	--	--	46	45	44	46	47	--	--	48	47	47	48	49	--	--	--	45
June																																
Maximum.....	48	50	50	50	--	--	52	53	54	--	55	--	--	54	52	53	54	52	--	--	51	51	54	56	56	--	--	56	54	53	-	53
Minimum.....	48	50	49	50	--	--	52	52	54	--	54	--	--	53	52	53	54	52	--	--	51	51	54	54	56	--	--	54	54	53	-	52
July																																
Maximum.....	54	55	--	--	--	60	63	60	63	--	--	64	62	63	64	63	64	65	65	64	66	66	64	--	--	67	68	68	70	70	--	64
Minimum.....	54	55	--	--	--	60	62	60	61	--	--	64	62	63	64	63	64	65	64	64	66	65	64	--	--	66	68	68	70	70	--	64
August																																
Maximum.....	--	72	72	72	72	71	71	--	72	72	72	72	72	--	--	70	70	70	70	70	--	--	72	70	68	67	66	--	--	66	66	70
Minimum.....	--	72	72	72	72	71	71	--	71	72	72	72	72	--	--	70	70	70	70	70	--	--	72	70	68	67	66	--	--	66	66	70
September																																
Maximum.....	66	66	64	--	--	--	60	60	60	60	--	--	58	58	57	55	53	--	--	52	--	51	51	51	--	--	52	52	51	51	-	56
Minimum.....	66	66	64	--	--	--	60	60	60	60	--	--	58	58	57	55	53	--	--	51	--	51	51	51	--	--	52	51	51	51	-	56
October																																
Maximum.....	51	--	--	52	56	52	52	53	--	--	52	52	52	52	52	--	--	50	50	50	49	50	--	--	49	49	49	49	52	49	--	51
Minimum.....	51	--	--	52	56	52	52	52	--	--	52	52	52	52	52	--	--	50	50	50	49	50	--	--	49	49	49	49	49	49	--	51
November																																
Maximum.....	52	52	52	52	52	--	--	48	48	47	--	46	--	--	44	44	44	44	44	--	--	42	--	42	42	--	--	39	--	38	-	46
Minimum.....	52	52	52	52	48	--	--	48	48	47	--	46	--	--	44	44	44	44	44	--	--	42	--	42	42	--	--	39	--	38	-	46
December																																
Maximum.....	38	38	40	--	--	41	41	40	42	41	--	--	40	39	38	38	38	--	--	36	36	38	36	37	--	--	35	36	36	36	36	38
Minimum.....	38	38	40	--	--	41	41	40	41	41	--	--	40	39	38	38	38	--	--	36	36	38	36	37	--	--	35	35	36	36	36	38

268. Flathead River near Polson, Mont. (12-3720)

Summary of twice-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1954	Max										57	46	41
	Min										46	41	35
1955	Max	37	37	36	50	50	62	71	70	70	54	46	37
	Min	34	32	32	36	42	44	49	66	53	45	32	33
1956	Max	36	34	38	46	58	59	74	74	68	56	44	40
	Min	33	33	34	36	40	45	57	64	56	44	38	33
1957	Max	37	35	39	50	60	65	72	71	66	60	46	39
	Min	32	33	34	38	44	51	59	66	58	45	39	35
1958	Max	37	38	44	48	63	68	--	76	72	57	47	39
	Min	34	34	36	42	47	56	61	70	54	47	36	34
1959	Max	41	37	42	44	52	65	74	69	63	54	48	39
	Min	33	32	35	39	42	50	59	63	54	48	32	34
1960	Max	34	36	39	43	51	62	74	73	62	58	46	38
	Min	32	32	33	37	42	48	61	60	58	46	38	34
1961	Max	38	38	42	43	54	68	74	75	71	53	43	36
	Min	32	34	35	40	41	54	65	70	52	42	34	32
1962	Max	36	36	38	48	52	66	--	--	63	59	48	40
	Min	32	32	33	39	40	51	--	--	58	49	39	36
1963	Max	39	37	40	48	62	66	--	73	70	67	49	37
	Min	32	34	36	40	42	56	--	68	62	49	39	32
1964	Max	36	36	38	44	54	58	70	68	62	--	--	50
	Min	34	35	32	40	41	48	58	64	--	--	--	38
1965	Max	40	36	40	45	49	56	70	72	66	56	52	42
	Min	35	33	33	38	41	48	54	66	51	49	38	35
Extremes for years 1954-65													
	Max	41	38	44	50	63	68	74	76	71	67	52	42
	Min	32	32	32	36	40	44	49	60	51	42	32	32

269. Clark Fork near Plains, Mont. (12-3890)

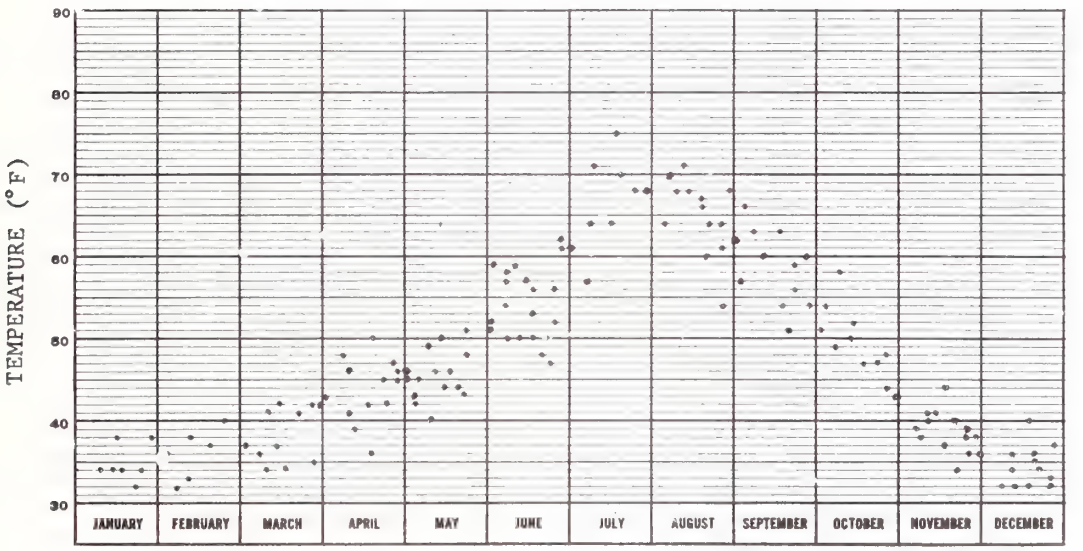
Location.--At gaging station, lat 47°25'50", long 114°51'20", in SW¼ sec.1, T.19 N., R.26 W., on right bank 2 miles southeast of Plains, 6 miles downstream from Flathead River, and at mile 239.0. Datum of gage is 2,449.34 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--19,958 sq mi.

Water temperature records available.--153 spot observations made at time of discharge measurements during period March 1949 to December 1965.

Extremes.--Discharge 1910-65: Maximum, 134,000 cfs June 5, 1948; minimum, 3,200 cfs Feb. 8, 1936, Dec. 10, 1940.

Water temperatures 1949-65: Maximum observed, 75°F July 18, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1949-65

269. Clark Fork near Plains, Mont. (12-3890)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
30-53	1305	38	9-54	1130	32	15-49	1200	34	19-49	1430	50	11-49	1330	46	23-50	1005	52
21-55	1300	32	25-54	1230	40	7-50	1430	36	6-50	1100	48	21-49	1500	51	9-52	1130	59
12-56	0930	34	12-59	1230	33	26-51	1300	42	23-51	1300	42	3-50	1100	42	6-53	1300	50
24-58	1500	34	13-61	1200	38	10-53	1100	41	29-52	1200	46	20-50	1200	43	17-54	1200	50
15-59	1230	34	14-62	1315	38	9-55	1200	34	5-54	1300	48	1-53	1100	46	28-55	1100	61
16-61	1225	38	20-64	1430	37	27-58	1500	35	12-55	1300	39	4-54	1300	45	21-56	1500	47
21-63	1330	32	4-65	1245	36	12-59	1030	37	18-56	1400	36	10-55	1600	40	19-57	1300	48
17-64	1230	34				23-60	1130	41	29-58	1600	45	15-56	1500	46	6-59	0930	54
						13-61	1300	42	28-59	1300	42	21-57	1330	48	17-59	1430	56
						13-62	1330	37	18-60	1100	42	14-58	1930	44	6-60	1300	57
						2-65	1235	37	12-61	0930	41	19-59	0900	44	24-60	1410	56
						31-65	1630	42	12-62	1030	46	17-60	1700	46	7-61	1300	58
									26-62	1130	47	1-61	1230	45	11-62	1630	50
									1-64	1430	43	10-62	1300	49	28-62	1100	62
									23-65	1350	45	13-63	1530	50	3-63	2050	59
												4-64	1430	43	13-63	1430	57
															1-64	1630	52
															18-64	1700	53
															1-65	1435	51
July			August			September			October			November			December		
9-49	0930	64	6-49	1130	70	19-51	1630	63	9-52	1600	58	7-49	1400	39	15-49	1100	32
1-53	1100	61	28-52	1530	61	3-53	1300	66	28-54	1000	44	10-52	1245	41	14-52	1100	36
17-54	1800	64	11-53	1200	68	29-54	1700	54	12-55	1630	50	17-53	1500	44	29-53	1200	37
26-55	1000	68	17-54	1700	66	7-55	0930	63	3-58	1330	54	29-54	1800	38	28-54	1200	33
19-56	1230	70	22-56	1230	60	20-56	1100	63	2-59	1000	51	27-56	1400	39	14-56	1200	34
30-58	0830	68	28-57	1130	54	23-57	1730	56	28-59	1400	48	27-57	1300	36	20-57	1330	35
8-59	0930	57	30-58	1630	68	1-59	1600	62	31-60	0930	43	12-58	1430	41	22-59	1030	34
18-60	1650	75	4-59	1000	64	28-60	1200	60	16-62	1000	47	30-59	1500	36	12-60	1300	32
10-61	1500	71	8-60	1230	68	11-61	0930	60	22-63	1630	47	21-60	1200	40	18-61	1430	32
30-64	1400	68	10-61	1130	71	20-62	1600	54	6-64	1130	49	8-61	1230	38	18-62	1300	40
29-65	0845	68	16-62	1130	67	24-63	0900	59	13-65	1225	52	23-62	1330	34	26-63	1300	32
			21-63	1300	64	3-64	1100	57				27-63	1130	38	19-64	1350	32
			26-65	1010	64	22-65	1535	51				12-64	1550	40	20-65	1040	36
												16-64	1000	37			
												17-65	1110	44			

270. Thompson River near Thompson Falls, Mont. (12-3895)

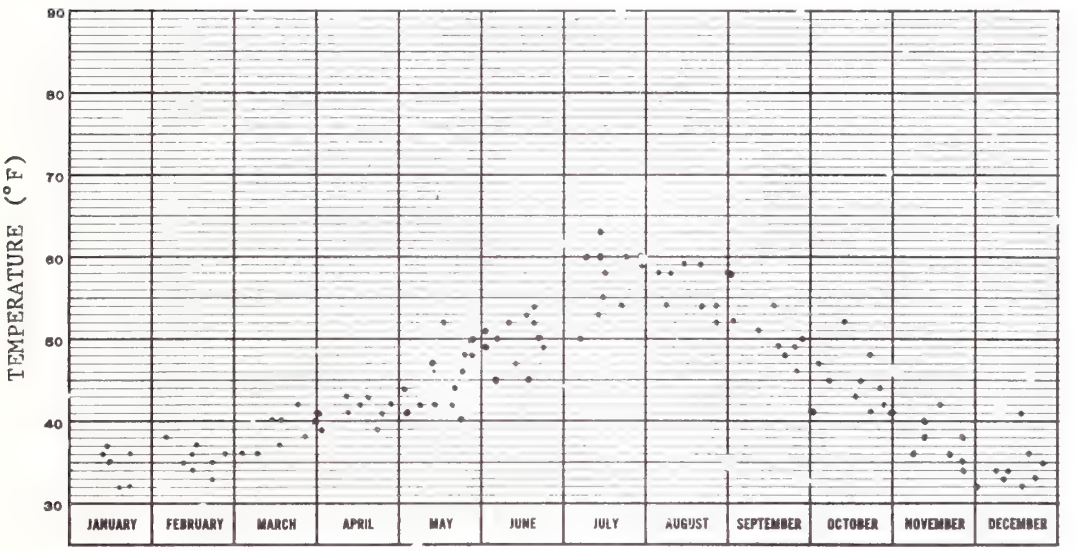
Location.--At gaging station, lat 47°35'35", long 115°13'40", in NE¼SE¼ sec.7, T.21 N., R.28 W., on right bank 1.3 miles upstream from mouth and 6 miles east of Thompson Falls. Altitude of gage is 2,430 ft (from river-profile map).

Drainage area.--642 sq mi.

Water temperature records available.--119 spot observations made at time of discharge measurements during period April 1956 to December 1965.

Extremes.--Discharge 1948, 1956-65: Maximum, 6,190 cfs during flood in May to June 1948; minimum, 68 cfs Dec. 10, 1964.

Water temperatures 1956-65: Maximum observed, 63°F July 18, 1960; minimum, freezing point on many days during winter months.



Spot observations of water temperatures, 1956-65

270 . Thompson River near Thompson Falls, Mont. (12-3895)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
25-57	1100	32	14-57	0900	34	6-57	1700	36	17-56	1630	42	15-56	0830	42	20-56	1600	49
24-58	0830	36	27-58	0900	36	27-58	0830	38	24-57	0900	39	21-57	1000	40	18-57	1500	54
15-59	1500	36	12-59	1400	35	12-59	1600	40	29-58	1730	42	15-58	1600	52	18-58	1000	52
17-61	1045	35	24-60	1700	33	22-60	1730	42	16-59	1630	42	24-58	1205	48	6-59	1300	45
24-62	1700	32	14-61	1145	36	14-61	1130	40	18-60	1315	43	18-59	1430	42	19-59	1300	50
21-63	1600	32	15-62	1200	37	14-62	1000	37	12-61	1030	41	18-60	1600	44	6-60	1830	45
16-64	1000	37	24-64	1100	35	3-65	1235	36	12-62	1330	43	2-61	1100	44	16-60	1530	53
			5-65	1315	38	21-65	1300	40	26-62	1400	41	22-61	1200	46	7-61	1530	50
									2-63	1530	39	28-61	1700	47	11-62	1900	52
									1-64	1630	41	11-62	1000	42	13-63	0930	47
												14-63	1400	47	1-64	1830	51
												28-63	1430	50	18-64	0930	45
												4-64	1630	41	1-65	1720	49
												20-64	1330	48			
July			August			September			October			November			December		
18-56	1600	60	21-56	1630	59	19-56	1500	54	25-56	0900	44	27-56	1200	34	14-56	1000	34
25-57	1530	60	27-57	1500	54	24-57	1130	46	22-57	1100	41	27-57	0800	35	20-57	0830	36
30-58	1200	59	4-59	1700	58	2-59	1430	52	3-58	1200	47	12-58	1230	40	11-58	1530	34
7-59	0900	50	9-60	1100	54	1-60	1600	58	1-59	1200	41	22-60	1030	36	1-59	0800	32
18-60	1920	63	10-61	1400	58	29-60	1800	50	29-59	1800	42	8-61	1400	36	21-59	1500	33
10-61	1830	60	16-62	1430	59	11-61	1120	51	31-60	1630	41	27-63	1400	38	13-60	1100	33
17-62	1500	53	21-63	1430	54	20-62	1230	49	18-61	1600	45	12-64	1010	38	18-61	1630	32
24-63	1230	54	27-65	1150	52	24-63	1100	49	16-62	1300	43	18-65	1125	42	18-62	1530	41
18-64	1100	55				3-64	1310	52	22-63	1400	48				26-63	1430	35
19-65	1810	58				21-65	1200	48	6-64	1330	45				19-64	1620	32
29-65	1855	60							13-65	1000	52				20-65	1345	36

271 . Prospect Creek at Thompson Falls, Mont. (12-3907)

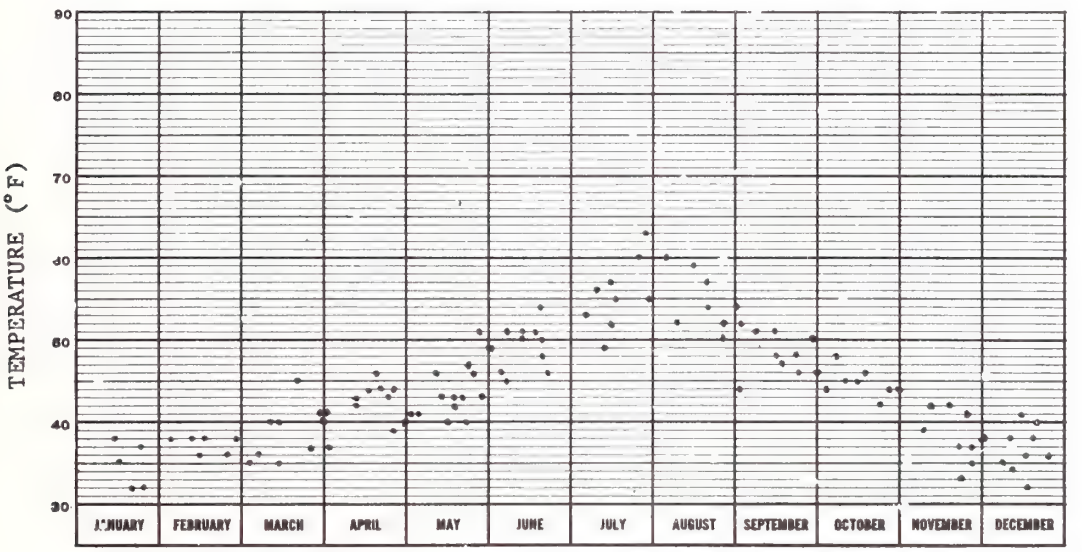
Location.--At gaging station, lat 47°35'15", long 115°21'20", in lot 12, SE¼SE¼SE¼ sec.7, T.21 N., R.29 W., on right bank 500 ft downstream from Dry Creek, half a mile upstream from mouth, and half a mile south of Thompson Falls. Altitude of gage is 2,400 ft (from topographic map).

Drainage area.--182 sq mi.

Water temperature records available.--111 spot observations made at time of discharge measurements during period May 1956 to December 1965.

Extremes.--Discharge 1956-65: Maximum, 2,860 cfs May 21, 1956; minimum, 30 cfs Dec. 11, 1961.

Water temperatures 1956-65: Maximum observed, 63°F July 29, 1965; minimum, freezing point at times during winter months.



Spot observations of water temperatures, 1956-65

271. Prospect Creek at Thompson Falls, Mont. (12-3907)
Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
25-57	1000	32	14-57	1000	36	6-57	1500	36	24-57	1100	39	15-56	1100	40	20-56	1400	46
24-58	0900	37	27-58	1100	38	27-58	1000	37	30-58	0930	40	21-57	0900	40	18-57	1400	54
15-59	1630	38	12-59	1530	38	17-59	1530	40	16-59	1500	44	24-58	0930	46	18-58	0800	50
17-61	0920	35	24-60	1530	36	22-60	1600	45	18-60	1450	46	18-59	1700	43	6-59	1530	45
24-62	1500	32	15-62	1030	38	14-61	1000	40	19-60	1500	44	18-60	1430	42	19-59	1130	48
21-63	1700	32	5-65	1055	38	14-62	1100	35	12-61	1400	42	2-61	0900	41	5-60	1900	46
16-64	1100	38				3-65	1110	35	12-62	1500	43	22-61	1530	47	6-60	0900	45
						31-65	1150	40	26-62	1630	44	29-61	0900	43	16-60	1800	51
									2-63	1400	37	11-62	1300	46	7-61	1730	51
									1-64	1800	41	14-63	1100	43	12-62	1500	50
									22-65	1920	43	28-63	1730	51	12-63	1900	51
												4-64	1830	41	18-64	1300	48
												20-64	1000	43	1-65	1930	49
July			August			September			October			November			December		
18-56	1400	57	21-56	1400	57	19-56	1400	51	25-56	1030	42	27-56	1100	37	13-56	1500	38
25-57	1430	60	27-57	1230	52	24-57	1030	46	3-58	0900	44	27-57	0900	35	11-58	1630	35
30-58	1100	55	4-59	1600	60	2-59	0900	44	1-59	1700	46	12-58	1130	42	1-59	0930	38
7-59	1800	53	9-60	0900	52	1-60	1730	54	29-59	1300	44	22-60	0900	37	21-59	1330	40
19-60	1200	55	16-62	1600	59	29-60	1700	50	31-60	1500	44	8-61	1530	39	13-60	1000	34
11-61	1230	56	21-63	1600	54	11-60	1300	51	18-61	1700	46	23-62	1600	33	19-61	0930	36
17-62	1300	49	27-65	1020	50	20-62	1000	48	16-62	1700	45	27-63	1500	41	18-62	1700	41
18-64	1330	52				24-63	1230	48	6-64	1430	48	18-65	1005	42	26-63	1530	36
29-65	1725	63				3-64	1530	52	13-65	0835	45				19-64	1735	32
						21-65	1055	47							20-65	1435	38

272. Clark Fork at Thompson Falls, Mont. (12-3910)

Location.--At gaging station, lat 47°35'50", long 115°31'50", in SE¼NW¼ sec.7, T.21 N., R.29 W., on right bank a quarter of a mile downstream from The Montana Power Co. dam, a quarter of a mile downstream from Prospect Creek, half a mile west of Thompson Falls, and at mile 207.3. Altitude of gage is 2,340 ft (from topographic map).

Drainage area.--21,113 sq mi.

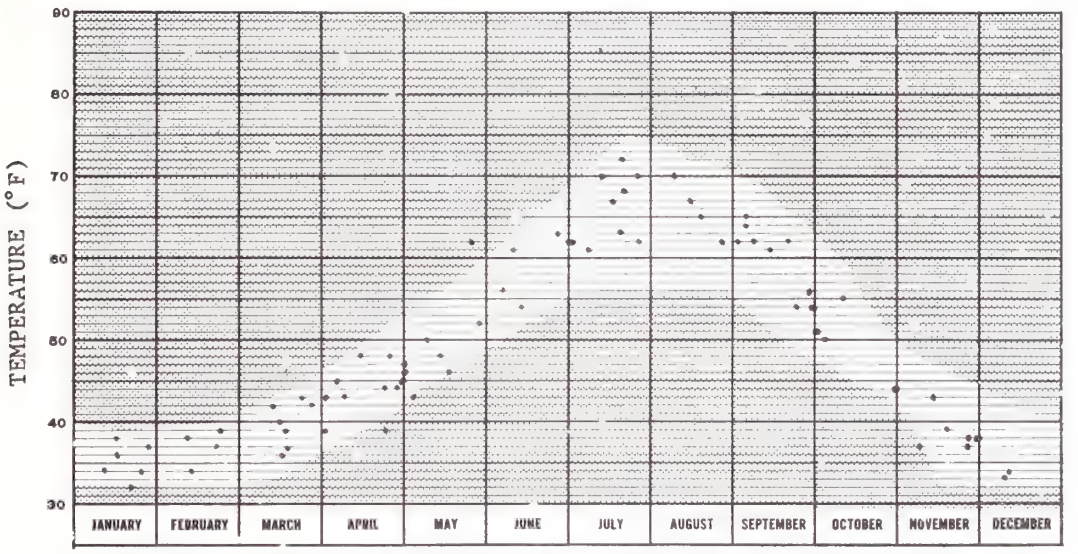
Water temperature records available.--77 spot observations made at time of discharge measurements during period April 1952 to May 1964. Daily maximum and minimum from hourly readings in penstock of Thompson Falls dam during period August 1959 to November 1965 published in this report.

Extremes.--Discharge 1948, 1951-59: Maximum, 150,000 cfs May 31, 1948; minimum, 495 cfs Sept. 1, 2, 1958.

Water temperatures 1952-65: Maximum observed, 75°F July 20, 1960; minimum, freezing point on many days during winter months.

Remarks.--Water temperatures affected by storage in Thompson Falls Reservoir. Water is drawn to turbines at point 26 ft below full pond elevation (2,396 ft).

Cooperation.--Daily maximum and minimum furnished by The Montana Power Co.



Spot observations of water temperatures, 1952-64.
The unshaded area delineates the range between the highest and lowest monthly temperatures from hourly observations, 1959-65.

272. Clark Fork at Thompson Falls, Mont. (12-3910)

Water temperatures at time of discharge measurements

Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F	Date	Time	°F
January			February			March			April			May			June		
29-59	1555	37	25-54	1700	39	10-53	1600	42	17-52	1630	48	1-53	1430	46	9-52	1630	61
21-55	1000	32	14-57	1200	34	12-56	1300	36	30-52	0900	45	27-58	1200	62	5-60	1600	56
12-56	1300	34	13-61	1600	38	12-59	1330	40	24-57	1230	39	18-60	1110	46	12-62	1100	54
25-58	1130	34	14-62	1730	38	26-59	1630	42	28-59	1700	44	1-61	1600	47	28-62	1500	63
16-59	1000	36	24-64	1520	37	13-61	1630	39	12-61	1630	43	29-61	1230	52			
16-61	1530	38				24-61	1330	43	12-62	1800	43	10-62	1730	50			
22-63	1130	32				13-62	1700	37	26-62	1830	48	14-63	0900	48			
									2-63	1000	39	5-64	1030	43			
									24-63	1130	44						
									2-64	1030	43						
									8-64	1115	45						
July			August			September			October			November			December		
15-52	1730	67	29-52	1100	62	4-53	1000	64	10-52	1015	55	17-53	1030	43	13-56	1430	34
1-53	0830	62	18-54	1200	65	4-53	1430	65	3-58	1000	50	30-54	1000	38	12-60	1600	33
25-55	1800	70	8-60	1700	70	30-54	1030	54	1-59	1500	51	27-56	1030	38			
19-56	1100	68	15-60	1630	67	6-55	1800	62	31-60	1300	44	27-57	1030	37			
25-57	1330	62				19-56	0930	62				21-60	1630	39			
2-58	1200	62				24-57	0930	54				9-61	1100	37			
7-59	1530	61				2-59	1300	62									
19-60	1805	72				29-60	0835	56									
11-61	0930	70				11-61	1600	61									
17-62	0930	63															

Water temperatures (°F), August to December 1959

Month	Day																												Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
August																																
Maximum.....	--	--	--	--	--	--	--	--	68	68	68	68	66	65	65	65	65	64	63	62	62	60	60	60	60	60	61	62	61	61	60	63
Minimum.....	--	--	--	--	--	--	--	--	67	67	67	66	65	65	64	65	64	62	62	61	60	60	60	60	60	60	60	60	60	61	60	62
September																																
Maximum.....	59	59	59	59	59	59	57	57	57	57	57	60	60	62	61	60	58	58	56	57	56	56	56	56	56	56	55	54	54	53	-	57
Minimum.....	59	59	59	59	58	57	57	57	56	56	57	60	60	61	6.	60	58	56	56	56	56	56	56	56	56	56	55	54	54	52	-	57
October																																
Maximum.....	53	51	50	51	52	53	51	51	49	49	48	48	49	50	50	51	51	50	50	50	50	49	49	50	50	50	49	48	48	47	46	50
Minimum.....	51	50	50	50	51	51	51	49	48	48	48	48	49	49	50	50	50	50	50	48	49	49	49	49	50	49	48	47	46	46	46	49
November																																
Maximum.....	46	45	46	45	44	42	42	41	41	41	41	40	37	34	33	32	33	33	33	34	34	34	35	38	38	38	36	35	36	36	-	38
Minimum.....	45	45	45	44	42	41	41	40	40	40	41	37	35	34	32	32	32	32	32	33	33	34	33	36	38	36	35	35	35	36	-	37
December																																
Maximum.....	37	37	38	38	36	36	36	36	36	35	36	36	37	36	36	38	38	38	38	37	37	37	37	36	36	36	36	36	35	34	34	36
Minimum.....	36	37	37	37	36	36	36	35	35	34	35	36	36	36	36	37	38	38	38	36	36	37	36	36	36	36	36	34	34	34	34	36

272. Clark Fork at Thompson Falls, Mont. (12-3910)
Water temperatures (°F), calendar year 1960

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	34	33	33	33	33	33	33	33	33	32	33	32	32	32	33	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Minimum.....	33	32	32	33	33	33	32	32	32	32	32	32	32	32	32	33	33	33	33	32	33	33	33	33	33	33	33	33	33	33	33	33
February																																
Maximum.....	33	33	33	33	33	36	34	36	36	36	36	37	37	36	36	36	36	36	36	36	36	36	36	35	35	34	33	33	33	-	-	35
Minimum.....	33	33	33	33	33	34	33	36	35	36	36	37	37	36	36	36	36	36	36	36	36	36	35	34	33	34	33	33	33	-	-	35
March																																
Maximum.....	33	33	33	33	33	34	34	34	33	34	34	35	36	36	36	37	37	38	39	39	41	42	43	43	45	45	45	45	45	44	44	38
Minimum.....	33	33	33	33	33	33	33	33	33	33	34	35	36	35	36	36	37	38	38	39	40	41	43	43	44	45	45	45	45	43	43	38
April																																
Maximum.....	43	43	44	45	46	48	49	50	49	49	47	47	46	45	48	43	43	43	44	45	44	44	43	43	43	43	44	46	46	47	-	45
Minimum.....	42	43	43	44	46	47	48	49	49	48	47	47	45	45	43	42	42	42	44	44	44	43	42	43	41	42	42	44	45	46	-	44
May																																
Maximum.....	47	47	49	50	51	51	51	51	51	53	54	54	53	52	52	54	50	50	48	48	47	47	47	46	48	48	49	49	51	53	54	50
Minimum.....	47	47	48	49	50	50	51	50	50	50	53	52	52	50	49	50	50	48	47	47	46	47	46	45	47	48	49	50	50	52	53	49
June																																
Maximum.....	54	56	55	55	55	56	57	56	58	58	58	59	59	59	59	58	56	54	55	55	54	53	54	57	58	58	58	59	61	62	-	57
Minimum.....	54	53	54	54	54	55	55	55	55	56	57	58	58	58	58	56	55	53	53	54	53	52	53	54	56	57	56	58	59	60	-	55
July																																
Maximum.....	63	63	63	65	65	66	67	68	68	68	69	70	70	71	71	72	72	74	73	75	74	73	73	72	71	71	71	72	72	73	71	70
Minimum.....	62	62	62	63	63	65	65	67	65	66	66	66	67	68	70	70	70	70	71	73	73	72	71	70	70	70	70	70	70	71	71	68
August																																
Maximum.....	71	68	68	68	69	68	68	70	69	69	70	70	70	69	68	66	64	64	64	65	66	66	62	60	59	58	56	57	57	57	58	65
Minimum.....	68	67	67	67	67	67	67	67	67	68	70	68	69	68	67	65	63	63	63	65	64	64	60	59	57	56	56	56	56	56	57	64
September																																
Maximum.....	60	62	64	63	63	62	60	59	59	60	60	60	61	62	62	62	62	62	61	60	58	59	58	56	57	57	57	56	56	56	-	60
Minimum.....	58	60	63	61	62	60	59	59	58	59	59	60	60	61	61	61	61	60	60	59	57	59	57	56	56	56	56	56	56	56	-	59
October																																
Maximum.....	57	55	56	55	56	56	55	55	54	53	52	51	50	50	49	48	49	49	50	49	49	50	50	50	49	49	48	47	46	46	45	51
Minimum.....	56	55	56	55	55	55	55	54	53	52	51	50	50	49	48	48	49	49	50	49	49	49	49	50	49	48	47	46	46	45	44	50
November																																
Maximum.....	49	45	44	44	43	43	42	40	40	39	39	40	40	40	40	40	40	40	41	41	42	41	40	40	40	41	41	40	39	38	-	41
Minimum.....	44	44	44	43	43	41	41	40	40	39	39	40	40	40	40	40	40	40	41	41	41	40	40	40	40	40	41	40	38	38	-	41
December																																
Maximum.....	38	38	36	37	36	36	34	33	33	34	34	34	34	34	34	34	33	34	34	35	35	35	36	36	36	36	35	35	35	35	35	35
Minimum.....	37	36	36	37	37	35	34	33	33	34	34	34	33	33	34	33	33	33	34	34	34	35	35	35	36	36	35	35	35	34	35	35

272. Clark Fork at Thompson Falls, Mont. (12 3910)

Water temperatures (°F), calendar year 1961

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	35	35	34	33	33	33	33	33	34	34	34	35	35	36	38	38	38	38	38	38	38	36	36	35	35	34	34	33	33	33	33	35
Minimum.....	35	33	33	33	33	33	33	32	34	34	34	34	34	35	36	38	38	38	38	37	36	36	35	34	34	33	33	32	32	33	33	34
February																																
Maximum.....	33	34	35	36	36	37	37	38	38	38	39	39	39	39	39	39	39	39	39	39	40	40	40	40	40	40	39	38	-	-	-	38
Minimum.....	33	33	34	35	36	37	38	38	38	38	37	39	39	38	39	39	38	39	39	39	39	40	40	39	40	39	39	38	-	-	-	38
March																																
Maximum.....	38	38	38	37	37	37	37	38	38	39	39	39	39	41	42	43	43	42	42	44	44	44	44	44	44	44	44	44	44	44	44	41
Minimum.....	38	38	38	37	37	36	36	38	38	39	39	39	39	41	42	42	42	42	42	43	44	44	44	44	44	44	44	44	44	44	44	41
April																																
Maximum.....	45	45	46	46	46	44	44	45	44	44	44	44	44	44	44	46	48	49	49	47	46	46	46	46	46	45	46	46	47	46	-	46
Minimum.....	45	45	45	45	44	43	44	44	44	44	44	44	44	44	44	44	46	48	47	46	44	44	45	44	45	45	44	46	46	46	-	45
May																																
Maximum.....	48	49	49	48	46	46	45	46	46	48	49	50	50	49	50	50	50	51	52	53	52	53	53	54	56	56	54	54	54	53	--	50
Minimum.....	46	48	48	48	46	45	44	45	45	47	48	48	48	49	49	50	49	50	50	50	50	52	52	53	53	54	53	52	53	53	--	49
June																																
Maximum.....	53	55	57	58	58	58	58	58	58	58	58	58	58	60	61	63	63	64	65	65	65	66	66	67	67	68	67	66	66	65	-	62
Minimum.....	53	54	55	56	57	57	58	58	57	57	58	58	57	58	59	60	61	62	63	64	64	64	64	64	66	66	65	65	64	63	-	60
July																																
Maximum.....	64	65	65	65	66	67	67	68	69	70	70	69	69	71	70	71	70	70	70	70	71	72	73	70	70	71	72	72	71	70	71	69
Minimum.....	63	63	64	64	64	65	66	66	67	67	68	68	68	70	69	70	70	69	69	70	70	70	70	70	70	70	71	71	70	69	69	68
August																																
Maximum.....	71	72	72	73	74	72	72	72	70	70	70	70	70	70	70	70	70	70	69	69	70	70	70	69	70	69	69	68	68	68	68	70
Minimum.....	69	70	70	71	72	72	69	70	70	69	69	70	70	70	70	70	68	68	68	69	69	69	69	69	70	69	69	68	68	68	66	69
September																																
Maximum.....	66	67	63	61	61	60	60	60	61	61	61	61	60	58	57	58	59	59	59	60	58	56	54	54	54	55	55	54	53	53	-	59
Minimum.....	65	63	61	60	60	60	60	60	60	60	60	60	59	57	57	58	58	59	59	58	57	55	53	53	54	53	54	52	52	52	-	58
October																																
Maximum.....	53	52	53	53	53	54	53	53	51	52	52	52	51	52	53	53	53	52	50	49	49	47	45	45	45	44	44	44	43	43	42	50
Minimum.....	52	52	52	52	53	53	53	51	51	51	52	51	51	52	52	52	52	50	49	49	49	47	45	45	45	44	43	43	43	42	42	49
November																																
Maximum.....	42	41	41	40	40	39	39	39	39	38	38	38	38	38	38	38	37	35	35	35	35	35	34	34	34	34	34	35	36	36	-	37
Minimum.....	41	41	40	39	38	38	38	38	38	38	38	38	38	38	38	38	37	35	35	35	35	34	34	34	34	34	34	34	35	36	-	37
December																																
Maximum.....	36	37	37	38	38	38	36	36	34	33	32	33	33	33	33	33	33	33	33	33	33	35	35	36	36	35	34	34	35	35	35	35
Minimum.....	36	36	37	38	38	37	36	36	34	33	32	32	32	32	32	33	33	33	33	33	33	33	34	35	35	34	33	33	34	34	34	34

272. Clark Fork at Thompson Falls, Mont. (12-3910)

Water temperatures (°F), calendar year 1962

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	35	34	35	35	35	36	36	36	35	34	33	32	33	33	33	33	33	33	33	32	32	32	32	33	33	34	33	33	33	33	33	34
Minimum.....	34	34	34	34	35	36	36	36	33	32	32	32	33	33	33	33	32	32	32	32	32	32	32	32	33	33	33	33	33	32	32	33
February																																
Maximum.....	33	33	33	35	35	35	34	35	36	36	37	37	38	38	38	38	38	38	38	38	38	37	37	34	33	33	33	33	-	-	-	36
Minimum.....	33	33	32	34	35	34	34	34	35	36	37	37	37	37	38	38	38	38	38	38	36	37	34	32	33	32	32	32	-	-	-	35
March																																
Maximum.....	33	33	33	33	33	33	33	35	36	36	36	36	36	37	38	39	39	40	41	42	43	42	42	41	41	42	42	42	42	42	44	38
Minimum.....	33	33	32	32	32	32	32	34	35	36	35	35	36	36	37	38	39	39	40	41	41	42	41	41	41	41	42	42	42	42	43	38
April																																
Maximum.....	44	45	47	48	48	48	48	46	46	45	45	46	48	48	50	49	50	51	52	51	51	49	50	50	50	48	48	46	45	45	-	48
Minimum.....	44	44	45	47	47	48	48	46	46	44	44	46	47	48	48	49	48	50	50	50	48	48	46	48	49	47	47	46	44	43	-	47
May																																
Maximum.....	44	45	46	46	46	47	46	47	49	49	50	50	49	50	49	50	51	51	51	51	50	51	52	52	52	52	54	54	54	52	53	50
Minimum.....	43	45	46	46	46	47	46	47	47	48	49	48	49	48	48	48	50	50	50	50	49	50	50	50	51	50	51	52	52	52	52	49
June																																
Maximum.....	52	55	55	53	52	52	53	54	54	54	56	56	56	56	56	57	59	60	61	62	62	62	62	62	64	64	62	62	64	65	-	58
Minimum.....	52	53	54	53	51	51	52	53	54	54	54	54	56	55	55	56	55	58	56	58	58	59	60	60	61	62	61	61	62	64	-	56
July																																
Maximum.....	64	62	63	61	62	61	63	65	66	67	68	67	65	65	66	66	65	65	65	66	65	68	67	69	69	70	70	70	71	71	71	66
Minimum.....	64	62	62	61	61	60	60	60	63	63	64	65	64	63	64	64	65	64	63	65	63	66	65	69	68	69	70	70	70	71	70	65
August																																
Maximum.....	71	70	70	70	67	64	64	65	65	65	66	67	68	68	69	66	69	68	66	68	67	66	65	64	64	64	62	62	60	60	60	66
Minimum.....	70	70	69	68	65	62	62	62	65	65	65	66	67	68	68	64	68	68	66	66	66	66	64	63	63	62	61	60	60	59	59	65
September																																
Maximum.....	62	62	62	61	60	61	61	61	59	58	57	56	56	56	56	56	57	58	59	59	60	60	60	60	61	61	61	59	59	56	-	59
Minimum.....	59	60	60	60	59	59	60	60	59	58	56	56	55	55	55	55	56	56	56	58	60	58	60	60	60	60	59	59	56	56	-	58
October																																
Maximum.....	56	55	55	55	55	54	53	53	53	52	52	50	50	50	49	50	49	48	48	48	49	50	49	50	49	49	48	48	48	47	47	51
Minimum.....	55	55	55	54	54	53	53	52	52	51	51	50	50	50	49	49	48	48	48	48	48	49	48	48	49	49	48	48	47	47	47	50
November																																
Maximum.....	48	48	47	47	47	46	46	46	45	45	45	44	44	43	43	42	42	42	42	42	42	42	42	41	40	40	40	40	40	39	-	43
Minimum.....	47	45	46	47	47	46	46	45	45	45	45	44	44	43	43	42	42	42	42	42	42	42	40	40	39	40	40	40	39	38	-	43
December																																
Maximum.....	38	38	38	38	38	38	40	40	40	40	40	40	40	40	40	40	41	41	41	41	41	40	39	38	36	36	35	36	36	36	37	39
Minimum.....	38	38	38	38	38	38	39	40	40	40	40	40	40	40	40	40	40	40	41	41	40	39	38	36	34	34	34	36	36	36	37	38

PEND OREILLE RIVER BASIN

272. Clark Fork at Thompson Falls, Mont. (12-3910)
Water temperatures (°F), calendar year 1963

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	38	38	39	39	38	37	37	36	36	36	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34
Minimum.....	37	37	39	39	37	37	37	36	36	33	32	33	33	33	33	33	33	32	32	32	32	32	32	33	32	32	33	32	32	32	32	34
February																																
Maximum.....	34	33	34	34	34	34	34	34	33	33	33	33	33	33	33	36	37	38	38	38	38	38	38	38	39	40	40	40	-	-	-	35
Minimum.....	33	32	32	33	33	33	33	32	33	33	33	33	33	33	33	34	36	37	38	38	38	38	38	38	39	40	40	40	-	-	-	35
March																																
Maximum.....	40	39	39	40	40	39	38	39	40	40	40	40	40	40	40	40	40	41	40	41	41	42	43	44	44	44	44	44	44	44	44	41
Minimum.....	40	39	39	40	40	38	38	38	39	40	40	40	40	40	40	40	40	40	40	40	41	42	41	43	44	44	44	44	44	44	44	41
April																																
Maximum.....	44	44	44	44	44	45	45	45	44	44	44	45	46	48	49	48	47	45	45	44	45	44	44	46	47	47	50	51	51	52	-	46
Minimum.....	44	44	43	44	44	44	44	44	44	44	44	44	45	47	48	47	45	44	43	44	44	44	44	45	46	47	49	50	51	50	-	45
May																																
Maximum.....	51	50	50	49	48	49	51	51	50	50	50	51	51	53	52	53	56	57	56	56	56	56	57	57	58	57	57	59	59	60	60	54
Minimum.....	51	49	49	47	47	47	48	48	50	49	48	49	49	49	51	52	53	55	56	56	56	55	56	57	56	56	56	56	58	58	58	52
June																																
Maximum.....	59	59	58	58	58	57	57	58	58	58	58	58	59	62	64	64	65	66	66	65	64	62	59	60	59	59	61	63	61	60	-	61
Minimum.....	56	58	58	57	56	55	55	56	56	56	56	57	58	60	60	62	62	62	64	63	62	59	58	58	58	57	59	60	59	58	-	59
July																																
Maximum.....	61	62	65	66	68	67	68	68	68	67	66	65	66	67	65	65	65	65	65	67	68	68	67	68	67	65	67	68	68	68	68	66
Minimum.....	59	60	61	62	64	64	65	66	65	65	65	63	63	64	64	63	64	63	64	66	67	66	66	67	66	65	65	67	66	67	67	64
August																																
Maximum.....	67	66	67	68	69	70	71	71	72	71	71	73	73	73	72	72	71	71	69	68	67	66	65	65	65	65	67	66	67	65	67	69
Minimum.....	66	64	65	65	67	68	69	68	70	70	69	70	70	72	70	70	69	70	68	68	66	64	63	63	64	65	65	63	64	64	65	67
September																																
Maximum.....	67	67	66	65	66	65	67	67	67	67	69	68	67	66	64	62	60	59	58	59	60	60	61	61	62	61	61	62	62	62	-	64
Minimum.....	66	65	63	63	63	64	65	65	66	66	66	66	67	64	62	61	59	58	57	58	59	59	60	60	60	60	60	60	61	61	-	62
October																																
Maximum.....	62	61	60	60	59	58	57	56	56	55	56	56	57	57	57	56	56	56	56	54	53	54	54	54	52	52	51	50	49	48	47	55
Minimum.....	61	60	59	59	59	58	56	56	55	52	55	56	57	57	56	55	55	55	54	53	53	53	54	53	52	50	49	48	48	47	47	54
November																																
Maximum.....	47	47	46	45	45	45	46	44	44	45	45	45	45	44	45	44	44	44	44	43	42	42	42	41	41	42	42	42	41	40	-	44
Minimum.....	47	45	45	45	44	45	45	44	44	45	44	44	44	44	44	43	43	43	43	42	41	40	41	41	40	41	41	41	39	39	-	43
December																																
Maximum.....	39	37	36	35	36	36	36	36	36	36	35	35	34	34	34	34	34	34	34	35	35	35	35	34	34	34	34	34	34	34	34	35
Minimum.....	38	37	35	35	35	35	36	36	35	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35

PEND OREILLE RIVER BASIN

272. Clark Fork at Thompson Falls, Mont. (12-3910)
Water temperatures (°F), calendar year 1964

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	34	36	36	37	37	37	37	37	36	35	35	36	36	35	36	37	37	37	37	36	37	36	35	--	--	36	37	37	37	37	37	36
Minimum.....	34	34	35	37	37	37	37	36	35	35	35	35	35	35	35	36	36	36	36	35	36	35	35	--	--	35	36	36	36	36	36	35
February																																
Maximum.....	38	38	38	38	39	38	37	38	37	38	38	39	38	38	38	38	39	39	39	39	39	38	39	40	39	38	38	38	38	-	-	38
Minimum.....	37	37	38	38	38	37	37	37	37	38	38	38	38	38	37	38	38	38	38	38	38	38	38	39	38	38	37	37	38	-	-	37
March																																
Maximum.....	39	39	39	39	39	39	40	39	38	38	39	40	39	40	40	41	41	41	41	42	42	42	41	39	38	38	38	39	40	41	43	40
Minimum.....	38	39	39	39	39	39	39	39	38	38	38	38	38	39	39	40	40	41	41	41	41	42	39	37	37	37	37	38	38	40	42	39
April																																
Maximum.....	44	44	44	44	46	46	46	46	47	48	48	47	47	46	46	46	45	45	46	47	48	47	46	45	46	46	46	48	46	47	-	46
Minimum.....	43	44	44	43	46	45	45	46	46	47	47	46	46	46	46	45	43	44	44	46	46	46	46	45	46	46	45	45	46	47	-	45
May																																
Maximum.....	48	49	48	46	46	48	48	47	48	48	50	52	51	51	52	54	54	54	54	55	53	51	51	50	51	49	52	52	52	52	53	51
Minimum.....	47	48	46	45	45	46	46	46	47	47	48	49	50	50	50	52	54	53	53	54	53	51	50	49	48	49	49	52	51	52	52	49
June																																
Maximum.....	55	55	55	54	53	52	52	52	51	50	52	52	53	53	54	54	53	53	53	53	54	56	61	63	64	60	63	61	60	61	-	55
Minimum.....	52	53	52	53	52	52	50	50	50	50	50	52	52	52	53	53	52	53	53	53	53	54	54	59	60	59	61	59	58	59	-	54
July																																
Maximum.....	65	64	64	64	62	63	65	68	68	67	70	70	69	69	68	66	69	68	68	69	69	69	69	69	69	69	69	70	70	68	68	68
Minimum.....	62	62	62	62	62	61	62	65	63	64	65	65	67	66	67	65	64	67	66	65	67	67	66	66	67	67	67	69	68	68	65	65
August																																
Maximum.....	66	65	64	66	67	67	68	68	67	68	68	68	67	67	66	67	68	67	65	63	63	63	65	65	65	63	63	60	59	58	57	65
Minimum.....	64	64	64	65	65	67	67	66	67	66	66	67	67	66	65	64	66	65	64	63	62	62	63	64	63	63	62	60	57	57	57	64
September																																
Maximum.....	57	56	56	58	60	59	59	59	58	58	58	58	59	58	58	58	58	56	56	55	54	54	55	54	54	54	54	54	54	54	-	57
Minimum.....	56	56	55	56	57	58	58	58	57	57	57	56	56	57	57	57	57	56	55	54	53	53	54	53	53	53	53	53	53	53	-	55
October																																
Maximum.....	54	53	52	50	50	50	50	50	50	50	50	50	50	51	51	50	50	49	48	48	47	47	47	47	47	47	47	46	46	46	47	49
Minimum.....	53	52	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	48	48	48	47	46	47	47	47	47	46	46	46	46	47	49
November																																
Maximum.....	47	48	47	46	45	45	44	44	44	44	44	44	44	44	43	41	40	40	40	41	41	40	40	40	40	41	40	40	39	38	-	42
Minimum.....	47	48	47	46	45	45	44	44	44	44	44	44	44	43	41	40	40	39	39	40	40	39	39	40	40	40	40	39	38	38	-	42
December																																
Maximum.....	38	38	40	40	40	40	40	39	38	38	38	38	37	37	37	35	33	33	33	33	33	34	34	34	34	34	35	34	34	34	34	36
Minimum.....	38	38	39	40	40	40	39	39	38	38	38	37	37	36	35	33	33	33	33	33	33	34	34	33	33	34	34	34	34	34	34	36

272. Clark Fork at Thompson Falls, Mont. (12-3910)
Water temperatures (°F), January to November 1965

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
January																																
Maximum.....	33	33	34	34	33	33	34	34	34	34	34	35	35	36	38	38	38	38	38	38	38	39	38	37	36	37	37	37	38	38	38	36
Minimum.....	33	33	33	33	33	33	33	33	33	33	34	34	35	35	37	38	38	38	38	38	38	38	37	36	36	36	36	37	38	38	38	36
February																																
Maximum.....	38	38	38	38	38	38	38	38	38	38	36	36	36	37	36	36	38	38	39	39	39	39	38	37	37	37	38	38	-	-	-	37
Minimum.....	38	37	38	38	38	38	38	38	37	36	36	36	36	36	36	36	36	37	38	39	39	39	37	36	36	37	38	38	-	-	-	37
March																																
Maximum.....	38	38	39	39	40	40	41	41	41	42	42	42	41	41	41	41	40	39	37	37	37	38	37	37	37	36	37	37	39	40	41	39
Minimum.....	38	37	38	38	39	39	40	40	41	42	42	40	40	40	40	40	38	37	36	36	37	37	37	36	36	36	36	36	38	40	41	38
April																																
Maximum.....	43	43	43	44	44	44	45	46	46	46	46	46	47	48	49	48	47	47	47	47	48	47	48	48	48	50	50	50	50	50	-	47
Minimum.....	42	43	43	42	44	44	44	45	45	46	46	46	46	47	48	48	47	46	46	46	47	47	48	48	48	49	49	49	49	49	-	46
May																																
Maximum.....	48	48	47	47	47	47	47	48	50	51	52	51	52	53	52	52	51	50	49	49	51	51	51	51	51	51	52	53	53	53	52	50
Minimum.....	48	47	46	46	47	47	45	46	48	49	49	50	51	50	51	51	50	49	49	49	50	51	51	51	50	50	50	51	52	53	51	49
June																																
Maximum.....	53	57	54	54	55	55	55	56	58	59	60	58	57	55	54	53	53	54	54	54	56	56	57	57	58	58	57	56	55	57	-	56
Minimum.....	51	52	53	54	53	53	53	53	54	55	57	57	55	54	53	53	53	53	52	53	55	55	55	56	56	57	55	55	54	54	-	54
July																																
Maximum.....	60	61	61	62	62	64	64	64	65	64	65	64	63	65	65	67	67	66	67	66	66	65	64	66	68	68	67	69	70	69	70	65
Minimum.....	56	59	60	61	60	61	63	63	63	63	63	63	62	63	64	64	65	65	64	65	65	[illegible]	62	64	66	67	67	69	69	69	69	64
August																																
Maximum.....	71	72	71	71	70	68	68	70	72	72	71	71	70	68	68	69	69	69	70	70	69	69	68	67	65	65	65	65	62	61	61	68
Minimum.....	70	71	70	70	68	67	68	69	70	71	69	69	69	67	67	67	67	67	67	68	68	68	66	65	64	65	64	63	60	60	59	67
September																																
Maximum.....	61	62	62	61	60	59	59	59	59	60	59	58	57	56	55	53	52	50	49	49	50	51	52	52	52	53	52	52	50	51	-	55
Minimum.....	60	62	62	60	59	57	57	58	59	59	58	58	57	55	53	52	49	49	48	49	49	51	51	51	50	52	52	51	50	50	-	54
October																																
Maximum.....	52	52	53	54	54	53	54	54	55	54	54	53	53	52	52	52	51	50	49	49	49	49	48	48	48	47	47	48	48	48	48	51
Minimum.....	51	52	53	53	53	52	53	54	54	54	53	53	53	52	52	51	50	49	49	49	49	48	48	47	47	47	47	47	47	47	48	50
November																																
Maximum.....	48	47	47	47	47	47	46	46	46	46	46	46	45	45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
Minimum.....	48	47	47	47	47	46	46	46	46	46	46	45	44	44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	--
December																																
Maximum.....																																
Minimum.....																																

272. Clark Fork at Thompson Falls, Mont. (12-3910)

Summary of once-daily temperature readings

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1959	Max	--	--	--	--	--	--	--	68	62	53	46	38
	Min	--	--	--	--	--	--	--	60	52	46	32	34
1960	Max	34	37	45	50	54	62	75	71	64	57	49	38
	Min	32	33	33	41	45	52	62	56	56	44	38	33
1961	Max	38	40	44	49	56	68	73	74	67	54	42	38
	Min	32	33	36	43	44	53	63	66	52	42	34	32
1962	Max	36	38	44	52	54	65	71	71	62	56	48	41
	Min	32	32	32	43	43	51	60	59	55	47	38	34
1963	Max	39	40	44	52	60	66	68	73	69	62	47	39
	Min	32	32	38	43	47	55	59	63	57	47	39	34
1964	Max	37	40	43	48	55	64	70	68	60	54	48	40
	Min	34	37	37	43	45	50	61	57	53	46	38	33
1965	Max	39	39	42	50	53	60	70	72	62	55	48	--
	Min	33	36	36	42	45	51	56	59	48	47	--	--
Extremes for years 1959-65													
	Max	39	40	45	52	60	68	75	74	69	62	49	41
	Min	32	32	32	41	43	50	56	56	48	42	32	32

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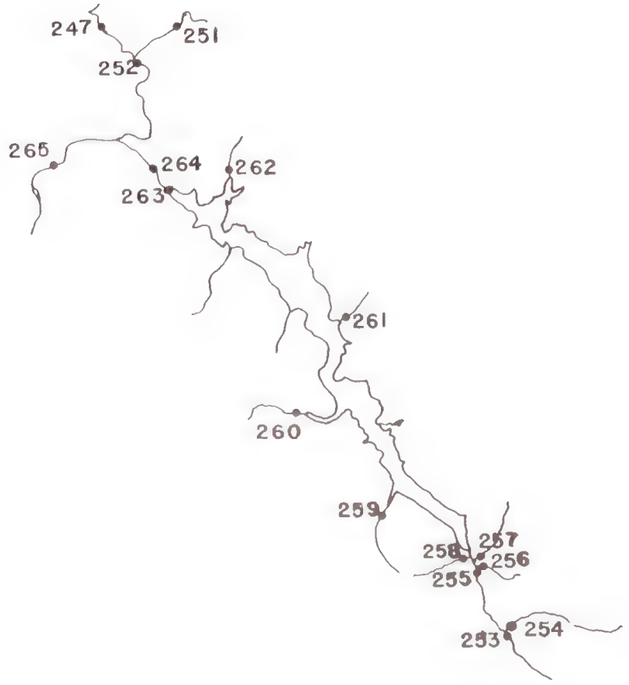

DETAIL A

Hungry Horse Reservoir Area

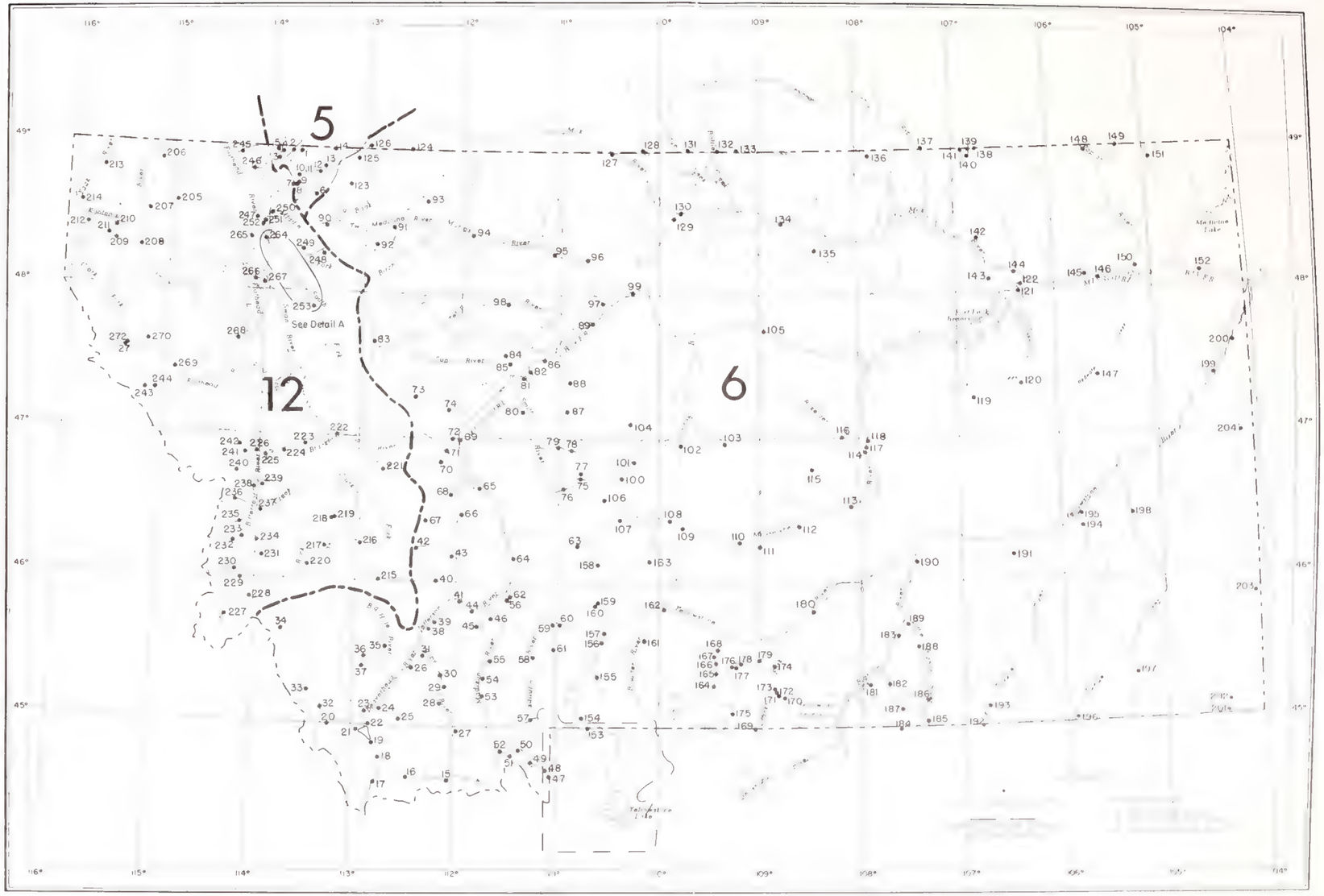

Figure 1 MAP OF MONTANA SHOWING LOCATION OF WATER TEMPERATURE SITES